

April
1961

COMMERCIAL FERTILIZER

and PLANT FOOD INDUSTRY

***DON'T LET PROFITS
GO UP YOUR STACK***

SEE PAGE 19

Sooner or Later
You'll be Packaging
Your Fertilizer in

50!
POUND
BAGS

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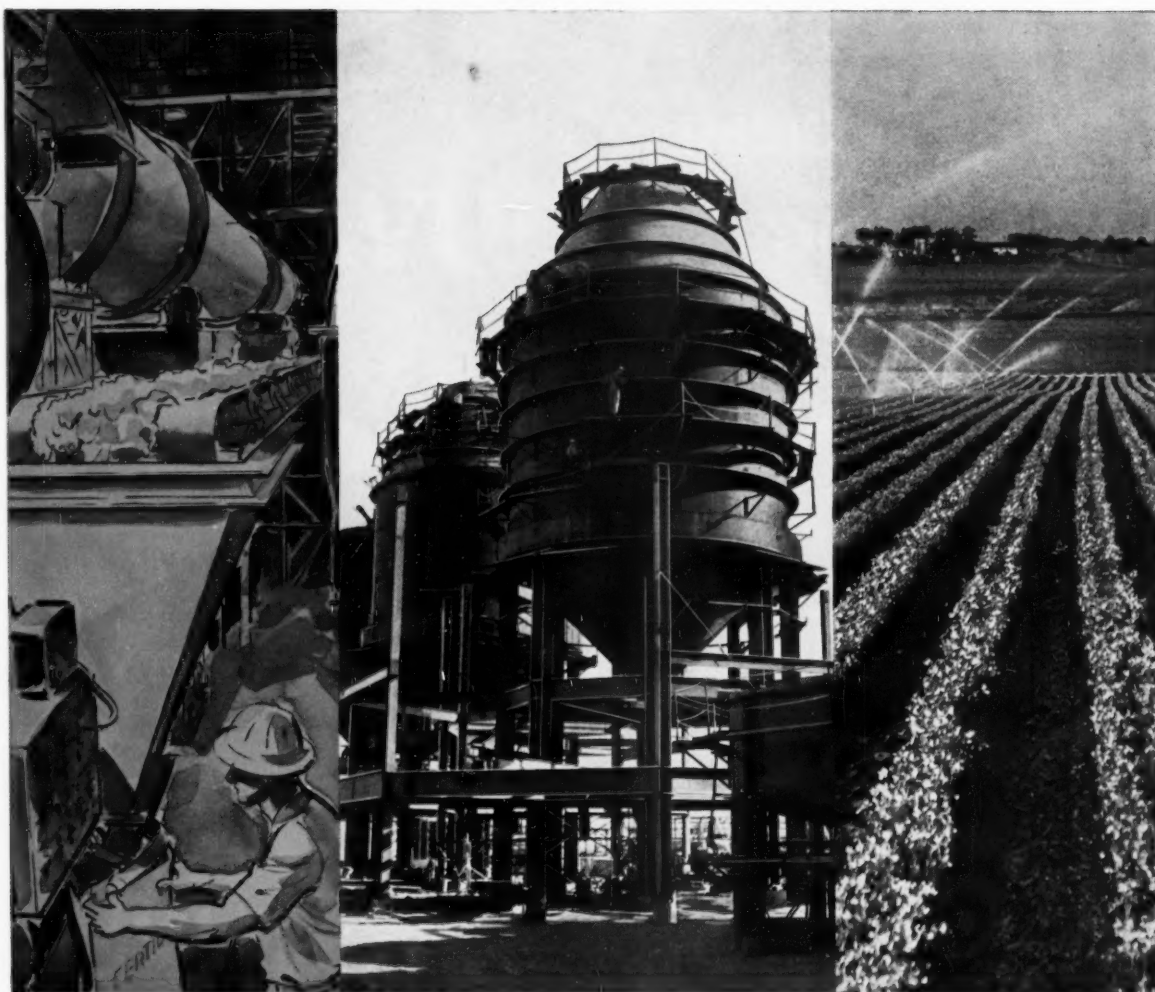
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◆ COMMENTING FREELY

by

Bruce Moran

Good old Spuds Johnson writes messages titled "Rural Common Sense" from his lair at the Florida AES. They are well named.

For example, Spud wrote one last month about burdensome surpluses of various foods, perishable and otherwise, which the Government has acquired in its effort to stabilize farm incomes by bolstering prices.

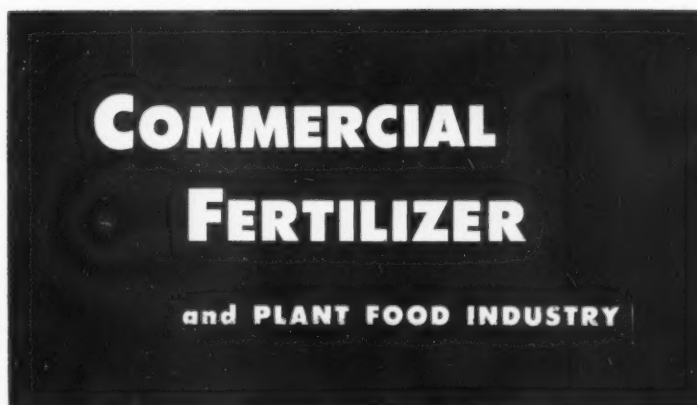
"That these surpluses are burdensome," Spud writes, "is admitted by practically everyone."

But: "While the surpluses are a costly burden, there are those who call attention to the fact that they are much less onerous than deficits or famines. In other words, many people are thankful that this country does have surplus foods.

"We could get rid of the surpluses by going back to the farming methods of a few years ago, but we would pay dearly for the privilege".

About \$13,000,000,000 extra — which modern farm methods save us annually, according to sound estimates.

April, 1961



Vol. 102, No. 4

April, 1961

Established 1910

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us Pp

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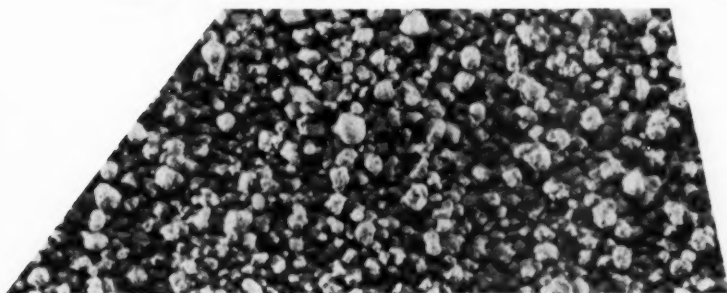
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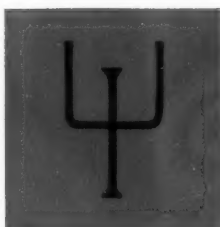
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A-1

SYMBOLS OF PLANT LIFE



*

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TODAY, THERE IS NO SECRET ABOUT THE ESSENTIAL ROLE POTASH PLAYS IN MIXED FERTILIZERS . . . HOW IT CONTRIBUTES TO THE PRODUCTION OF QUALITY CROPS.

SOUTHWEST POTASH CORPORATION PROVIDES MIXERS WITH A DEPENDABLE SUPPLY OF HIGH K₂O MURIATE . . . STANDARD, COARSE AND GRANULAR . . . FOR THE PLANT FOOD INDUSTRY.



15th Century Alchemy process

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*Another 15th Century Symbol for Potash



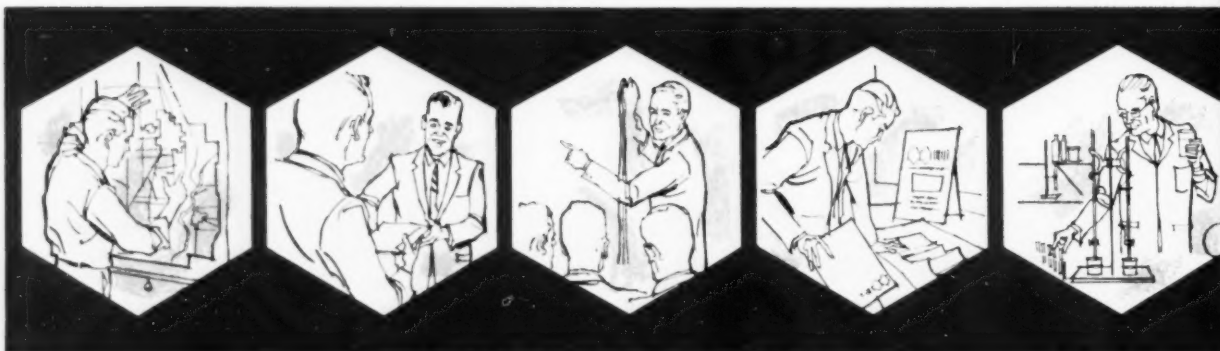
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FO-5-01



JUST AROUND THE CORNER

By Vernon Mount



BEARING OUT what we said here last month about "cry wolf," note that the politicians have stopped crying in their beer, and are encouraged about things getting better in the near future. Yet not a single one of the Kennedy bills intended to alleviate depression and its effects has been passed, as this is written.

THE "EMERGENCY" ANGLE - and it seems to have been strictly an approach to frighten the Congress - seems not to be working very well. And nature is taking its course . . . as the Easter retail sales have been demonstrating the last few weeks.

ALL IS NOT orchids, but all is not scallions, either. We have troubles - plenty of big and little concerns are in financial difficulties; plenty of wage-earners are not earning wages; plenty of our people have reason to be fearful. But this nation has a way of coming up smiling . . . and there's the hint of a grin now beginning to appear.

KEEP AN EYE on your receivables, and cut costs where you can without damage to your services. But continue as optimistic as we think you are.

Yours faithfully,

Vernon Mount

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**BREAK-
THROUGH**
in design and
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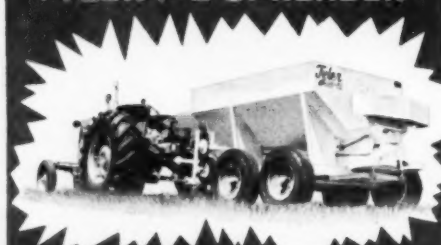
fertilizing equipment which you can rent
to your customers . . . spreads up to an
acre per minute.

- Hauls and spreads fertilizer quickly and efficiently
- 45 foot spread pattern
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Services you can use

Traffic Service: Cyanamid traffic specialists are ready to route and ship your orders without delays. Their knowledge can save you money, and can make your operation run even more efficiently.

Technical Service: Cyanamid's staff of technical experts are constantly at your service. Make your formulation and production problems theirs. That's their job.

Sales Service: Cyanamid sales representatives are available to work with you and for you in expanding present markets or in establishing new markets.

Products you can use

Cyanamid's phosphate business is the mining and manufacturing of the highest quality products for your mixed fertilizer requirements.

- Florida Natural Phosphate Rock
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- Phosphoric acid — an economical source of P_2O_5 for high analysis fertilizers

American Cyanamid Company, Agricultural Division, New York 20, N. Y. *TREBO-PHOS is American Cyanamid Company's trademark for its triple superphosphate.



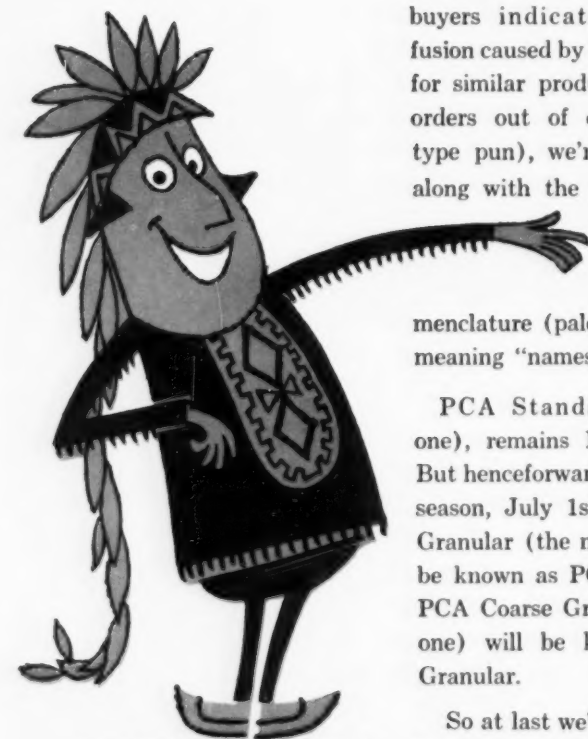
We're name dropping but...

Big Chief Kay-Two-Oh is only trying to impress you with the fact that all sizes of our 60% Muriate of Potash, by ANY name, are the best bet for your manufacturing operations.

At a recent pow-wow, a special committee of the National Plant Food Institute suggested that distress smoke signals from buyers indicate (ugh!) confusion caused by different names for similar products. To bring orders out of chaos (Indian-type pun), we're happy to go along with the rest of the industry in standardizing our nomenclature (paleface-type word meaning "names").

PCA Standard (the little one), remains PCA Standard. But henceforward, as of the new season, July 1st, PCA Special Granular (the middle one) will be known as PCA Coarse, and PCA Coarse Granular (the big one) will be known as PCA Granular.

So at last we've answered the question: What's in a name? Convenience for you in ordering from any source. But for top quality potash, and top service, be sure to order from PCA, top man on the totem pole.



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CARLSBAD, NEW MEXICO

"America's CHIEF Supplier of Potash"

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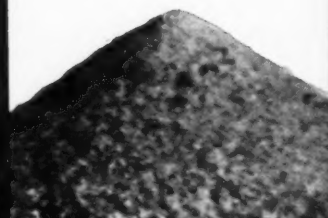
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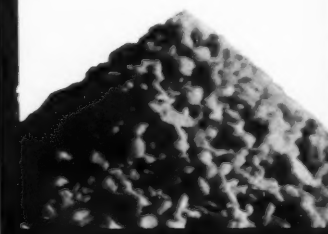
PCA STANDARD
(formerly Standard)



PCA COARSE
(formerly Special Granular)



PCA GRANULAR
(formerly Coarse Granular)





mighty good eating...for crops

the ammonium nitrate that's granular

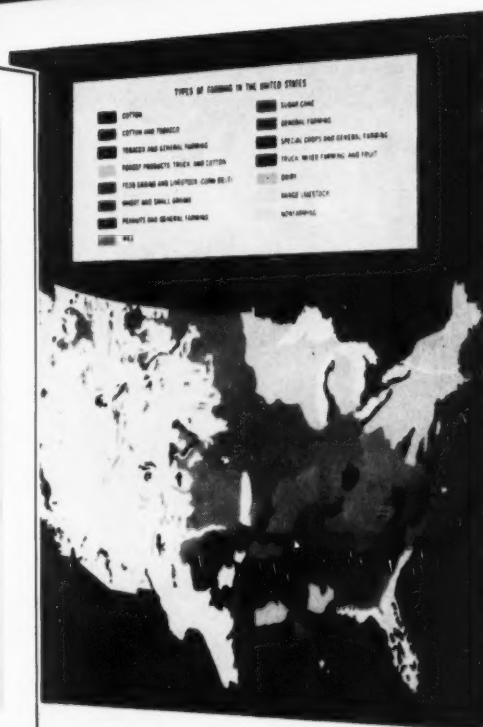
Whatever your crops, whatever your soil, when you need supplementary nitrogen, ask for Hi-D® Ammonium Nitrate. We believe you'll find it the most satisfactory crop and profit booster you ever used.

Hi-D always flows freely. It's made that way by a patented process. The result is granular material that's super dry. Hi-D has much less tendency to pick up moisture. It stays dry until

you're ready to use it. And Hi-D will not gum up, will not clog, will not cake, will not bridge in your spreader.

Join the thousands of farmers who have switched to Hi-D. But remember, first test your soil, lime if necessary, and follow with the mixed fertilizer your dealer recommends. Then add the supplementary boost of Hi-D... 33.5% nitrogen. Ask your dealer for it by name.

COMMERCIAL SOLVENTS CORPORATION, AGRICULTURAL CHEMICALS DEPARTMENT, ATLANTA, SHREVEPORT, ST. LOUIS, CHICAGO, NEW YORK



Hi-D boosts all crops
it's the ammonium nitrate that's granular

The main crops raised in the United States are shown above. Most probably, included, too. We believe that whatever crop, whatever your soil, you'll find Hi-D Ammonium Nitrate the most satisfactory crop and profit booster you ever used.

Nothing. Hi-D always flows freely. By a patented process. The result is material that's super dry. Hi-D has much less tendency to pick up moisture. It

stays dry until you're ready to use it. And Hi-D will not gum up, will not clog, will not cake, will not bridge in your spreader.

Join the thousands of farmers who have switched to Hi-D. Please remember, though, first test your soil, lime if needed and follow through with the mixed fertilizer your dealer recommends. Then add the extra boost of Hi-D... 33.5% nitrogen. Ask for it by name.



COMMERCIAL SOLVENTS CORPORATION, AGRICULTURAL CHEMICALS DEPARTMENT, ATLANTA, SHREVEPORT, ST. LOUIS, CHICAGO, NEW YORK

What Hi-D® does for crops ...Hi-D ads are doing for sales!

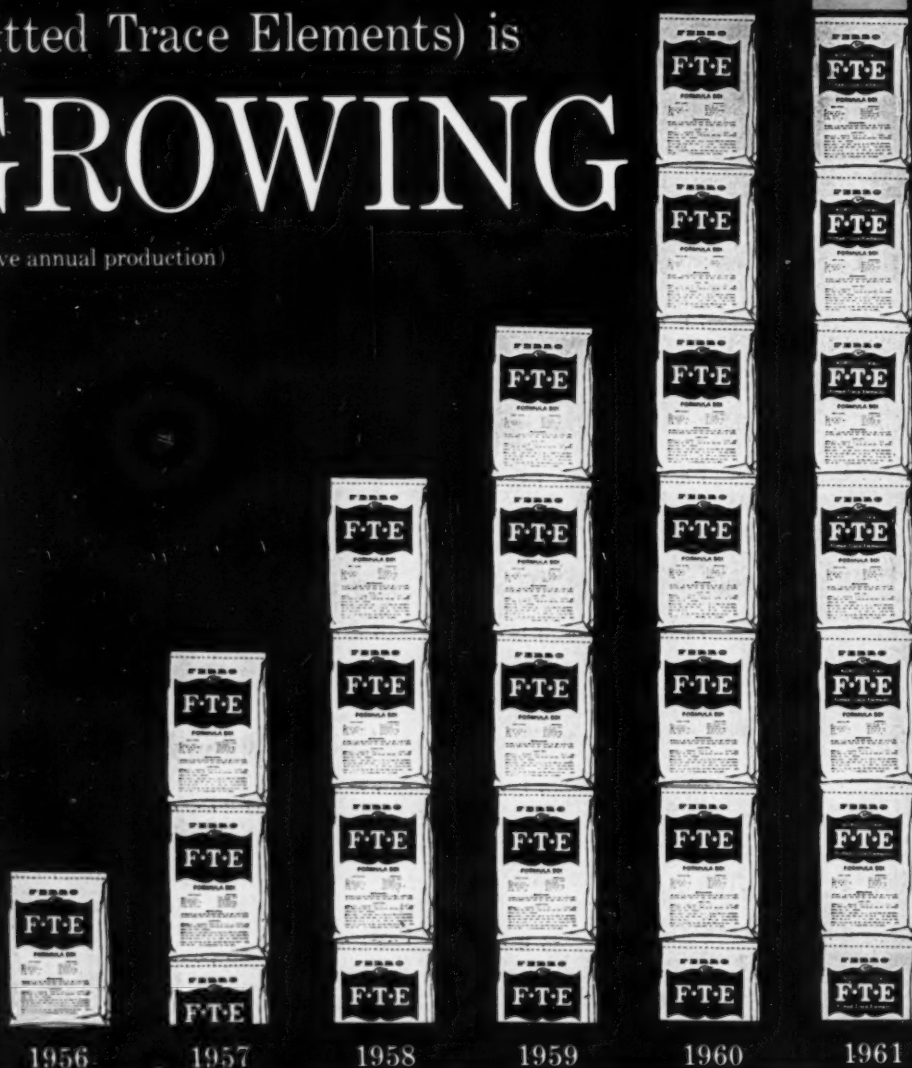
Hi-D boosts crops and Hi-D ads boost sales! The ads above, for example, are in full color. They will appear in *Progressive Farmer*, *Farm & Ranch*, and *Successful Farming*. Eye-catching, highly informative, they're sure to build increased demand for Hi-D. So be sure to have Hi-D... the granular ammonium nitrate... on hand to meet this profit opportunity.

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(Fritted Trace Elements) is

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Where trace elements are needed, FTE is consistently winning new friends. As a source of *boron . . . or manganese . . . or iron, zinc, copper and molybdenum* it is unsurpassed. Combining all *six* in a single product, it produces excellent results—often with no more than 1% mixed into good fertilizers.

Unlike soluble salts that leach out in heavy rains, or become fixed in the soil under certain conditions, FTE releases the nutrients as needed. "Fritting" makes possible *controlled, predetermined solubility*.

This, in turn, makes fertilizers more productive, much more predictable.

While *two* standard formulas are available, and others are being developed for specific areas of the country, all can be *safely used anywhere*, and on *any crops*, simplifying manufacturing and marketing for our fertilizer customers.

If you are not fully informed about FTE, let us tell you about it. Better yet, *try FTE* in your fertilizers this season. We'll be happy to work with you.



FERRO CORPORATION *Agricultural Division*

4150 East 56 Street • Cleveland 5, Ohio

Arcadian® News

Volume 6

Nitrogen Division, Allied Chemical Corporation

Number 4

How to Reduce Fumes and Dust in Dryer Operation

DON'T LET PROFITS GO UP YOUR STACK!

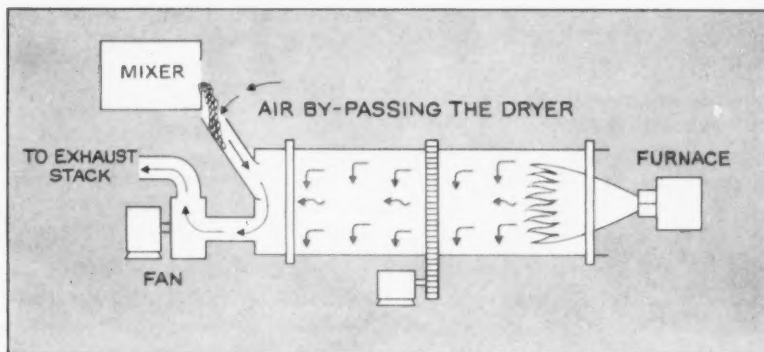
Are you losing money in dust and fumes from your dryer? Even when you receive no complaints about air pollution, clouds of dust, smoke and fumes emanating from your fertilizer plant are cause for concern. They can mean that plant foods which should be going into your fertilizer are going up your stack.

Dust and fumes usually mean that your dryer is not functioning properly. Here are four ways to improve the efficiency of your dryer—

① Control the Flow of the Drying Air

In many counter-current systems the sticky mass of fertilizer is fed from the mixer to the dryer through a chute and openings that are oversized deliberately to prevent a choked-up condition. The result is that the dryer fan usually pulls more of its air from the plant atmosphere than it does from inside the dryer. In extreme cases, so little air is pulled through the dryer that smoke from the furnace (which, incidentally, should not be smoking) backs up into the plant, adding to poor working conditions.

In co-current dryers there is little excuse for these air problems, for it is a simple matter to discharge the dry, granulated material without permitting much air to leak through the discharge point.



Excessive volume of air by-passing the dryer presents a barrier to heated air (red arrows) in the dryer. As a result, very little heated air is drawn through the length of the dryer.

In an attempt to approach a satisfactory level of drying under these conditions, many operators merely increase the total flow of air through the fan in the hope that a little of it will pass through the dryer. Unfortunately, increasing the flow of air much beyond the volume for which a system's dust collector is designed all too frequently results in most of the dust being forced through the collector into the plant atmosphere.

The best answer to inadequate air flow through the dryer is obvious: keep the feed chute as full of mix as possible

to exclude air, and add some constriction at the feed opening. Once you have reduced by-pass air to a minimum, you will notice a very definite improvement in dryer operation. In fact, any effort at all made in that direction will be well worth the trouble.

② Regulate the Furnace

To offset the lack of drying air, some operators make the mistake of increasing the intensity of the heat from the furnace. This only makes a bad situation worse, for a condition of extreme heat near the

furnace combined with too little air through the dryer often causes breakdown of some of the materials, with resulting air pollution and loss of plant food. What's more, this combination of little air and excessive heat is even more destructive to good granulation at the higher rates of production. Operators should be careful not to judge the performance of a furnace by the amount of fuel being consumed. Some oil burners have been observed to project raw oil as far as 15 feet into the dryer before a flame occurs. Obviously, the heat from that flame has little effect on the 15 feet of mix behind it. It is imperative to keep burners in good operating condition.

3 Keep the Dryer Clean

As the flights in a dryer become fouled, at least two important changes are taking place: 1) Less and less of the material is being exposed directly to the drying air. 2) The product tends to roll more and more, which may cause excessive balling or large granules, and, of course, insufficient drying. Most operators already know that every condition in granulation must be maintained at a uniform level for best performance. However, it bears repeating that the dryer should be kept free of all build-up from damp or excessively heated materials.

4 Maintain Uniform Feed through the Dryer

In batch operations it is difficult to maintain uniform feed into the dryer, but much has been done in this area to improve general performance.

Accomplishing uniform feed in continuous systems is more easily done. However, too many operators assume that a dryer is being fed uniformly because the rate of material makeup is being accomplished at a measured pace. They overlook the fact that the recycle may be very irregular. Accordingly, every effort should be made to smooth out the flow of recycle into the process. If this is impractical, a constant vigil should be kept on performance so that adjustments may be made quickly to compensate for any irregularities.

Make these Checks, too

In addition to the four points treated above, there are several other areas that deserve careful scrutiny by the operator plagued by fumes and dust problems. For example, where sulphuric acid is used with batch operations in granulation, semi-granulation, or merely to ob-

tain additional heat, some control over fumes and other losses can be effected by adding the potassium chloride after the acid has been neutralized in the ammoniation phase.

Ammonia fumes may well be caused by badly corroded or plugged distributor pipes—or a pipe system that may never have been designed properly in the first place. Since a properly operating distribution system is essential to good operations in general as well as to the control of fumes, operators would be well-advised to check this area periodically.

Where the venting of nitrogen solution measuring tanks at each charge creates an objectionable fume problem, it may be possible to operate through the existing measuring tank without this frequent venting. This can sometimes be done by merely increasing the pressure—within safe limits. Where pressure cannot be increased high enough with safety, a larger measuring tank will be required. Of course, the use of a meter in the flow line would eliminate any consideration of a measuring tank, while automatically solving the venting problem.

There have been instances where ammonia fumes have resulted from unrealistic ammoniation rates. For example, a formula may have been changed to derive more of the P_2O_5 from triple superphosphate. Where the original formula called for a substantial amount of normal superphosphate to be ammoniated at its maximum practical rate, the new formula should be adjusted for the lower ammonia take-up of triple superphosphate.

It Pays to be Cautious

There is no doubt that a great deal of the fumes, smoke and other losses in fertilizer plants result from overloading the equipment. This is bad enough when it is accidental, but is even worse when it is the result of a forced effort to increase production without first making a careful study of all the factors involved. Manufacturing mixed fertilizer has become a truly complicated operation; the easy way is not necessarily wrong, but it would be wise to check thoroughly before you change from a tried and true procedure. *If you need special help on any dust or fume control problem, we will be happy to assist you. This service is available to customers without charge. Just contact Technical Service, Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N.Y. Phone: HAnover 2-7300.*



How much is *ENUF* fertilizer?

Every farmer knows that you have to set a dozen eggs if you want to hatch a dozen chicks. But, many farmers do not seem to realize that you must have definite amounts of nitrogen, phosphate and potash in your soil, if you want to produce 100 bushels of corn per acre.

The example of the eggs and the chicks is a good, down-to-earth, easy-to-understand argument to use in selling fertilizer. It helps to convince the farmer that he should use *enuf* fertilizer per acre to produce the yields he wants.

Every Field a Test Plot

But a better way to demonstrate the value of fertilizer is to persuade farmers to run their own simple fertilizer tests. It's easy to make every field a demonstration plot.

Suggest to the farmer that he use no fertilizer on one strip across his field. This makes a check strip. Then tell him to double the usual fertilizer application on the next strip. Then use his normal application on the rest of the field.

Time spent in getting farmers to run these simple tests will pay off in extra sales. Many farmers, even when they follow state recommendations, are not using *enuf* fertilizer for maximum yields and profits. A strip with double the usual fertilizer application is often one of your best sales tools!

FAST TURN-AROUND OF TANK CARS HELPS YOU



In addition to producing the most complete line of nitrogen solutions, Nitrogen Division, Allied Chemical Corporation, operates the largest fleet of tank cars in the industry. All of our facilities and operations have been geared to rapid delivery of ARCADIAN® Nitrogen Solutions to help you meet production schedules. The goal is *on-time* shipment every day.

The ARCADIAN tank car fleet is large enough to handle just about every situation. However, if too many fertilizer manufacturers hold too many tank cars too long, the entire schedule is disrupted. A tank car sitting idle on your siding—or anyone else's—can't also be back at

the Nitrogen Division plant, taking on the rush order you just placed.

Everyone benefits when there is fast turn-around of tank cars at both ends of the track. Nitrogen Division, as producer, can coordinate production and shipment better; while you, as consumer, can handle your peak demands more efficiently. A tank car shortage hits mixed fertilizer producers hardest. That's why you should resolve to return tank cars as fast as possible.

It pays to push production a little beyond normal pace or hours, in order to empty a car for the next railroad pick-up. Keep the cars rolling so that you will never run short of nitrogen.

goods analyses and straight materials your customers need and want. It pays to establish your prestige and your leadership as a dependable, one-stop, full-line source of supply.

Here are some of the benefits you get when you sell ARCADIAN nitrogen: 1) You increase your total sales and profits. 2) You help farmers to get better yields and insure that response to your mixed fertilizers will not be limited by lack of nitrogen. 3) You spread your overhead expense over a larger tonnage. 4) You keep your sales staff busy over a longer period. 5) You build farmers into exclusive customers for you and your dealers.

Nitrogen Division, Allied Chemical, manufactures and sells nitrogen for use in making mixed fertilizers and for direct application. Nitrogen Division has always fostered the role of nitrogen in a balanced fertilizer program and has spent millions of dollars to promote the use of mixed fertilizers. Nitrogen Division has also established ARCADIAN Nitrogen Products as the leading source of supplementary nitrogen for direct application.

It will pay you to let Nitrogen Division work with you in helping you to offer your customers a complete line of mixed fertilizers and straight nitrogen materials. Many different ARCADIAN Nitrogen Solutions are available for the manufacture of every mixed fertilizer analysis now in demand. Many different ARCADIAN Nitrogen Products are also available to sell to farmers for direct application.

These products are powerfully promoted with the biggest nitrogen advertising campaign in history. It will pay you to cash in on this campaign now! Extend your season and handle more tonnage, by selling ARCADIAN Nitrogen Products!

SELL TONNAGE FOR TOP-DRESSING NOW

Top-dressing time is just ahead. When your rush season for mixed fertilizers is over, it will pay you to concentrate on aggressively selling ARCADIAN nitrogen materials (liquid and dry) for top-dressing and side-dressing. You can extend your season and sell more tonnage.

The market is there! Thousands of farmers in your sales territory will buy

nitrogen for supplemental application this spring and summer. It will pay you to make sure that your mixed fertilizer customers buy their straight nitrogen from you. You can't help but benefit when your customers make you their headquarters for all their fertilizer needs.

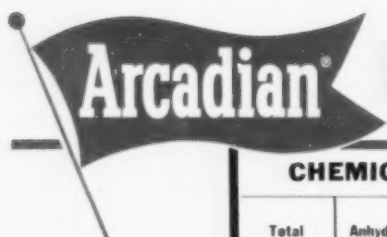
You strengthen customer loyalty and you get a bigger share of the fertilizer market, when you supply all of the mixed

 ARCADIAN	 ARCADIAN
DRY NITROGEN PRODUCTS FOR DIRECT APPLICATION	LIQUID NITROGEN PRODUCTS FOR DIRECT APPLICATION
AMMONIUM NITRATE Pelleted Nitrogen Fertilizer	Golden URAN® Nitrogen Solution Urea, Ammonium and Nitrate Nitrogen
UREA 45 Nitrogen Fertilizer Pelleted Urea Nitrogen	FERAN® Nitrogen Solution Ammonium and Nitrate Nitrogen
A-N-L® Nitrogen Fertilizer Nitrogen with Magnesium	NITRANA® Nitrogen Solution Nitrate and Ammonia Nitrogen
AMERICAN NITRATE of SODA Nitrate Nitrogen and Sodium	Anhydrous Ammonia Concentrated Ammonia Nitrogen

Don't miss this one!

"**PLANT CORN SOLID**" is the title of an article which appears in the February issue of **FARM JOURNAL**. It reports the success of a new idea: Plant corn in a solid stand with a grain drill—about 300,000 stalks per acre—then harvest it 50 to 60 days later for green feed or silage. Such a practice requires enormous quantities of fertilizer.

We suggest that you read this article. If you do not have the magazine, we will be happy to send you a reprint. Simply request this from Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.



NITROGEN SOLUTIONS

	CHEMICAL COMPOSITION %						PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water		Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60°F	Approx. Vap. Press. at 104°F per Sq. In. Gauge
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	15
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.184	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.050	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
6C	43.0	20.0	68.0	6.0	6.0	9.3	1.180	12	39
6M	44.0	22.0	66.0	6.0	6.0	10.0	1.158	17	14
10	44.4	24.5	56.0	10.0	9.5	11.0	1.114	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.087	25	- 7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
DURANA®									
DURANA contains 8% formaldehyde.	37.0	13.3	53.4	15.9	9.4	7.2	1.235	0	36
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.932	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.978	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	24.3	0.618	211	-108

Other ARCADIAN® Products: URAN® and FERAN® Solutions • Ammonia Liquor • N-dure® A-N-L® • Ammonium Nitrate • UREA 45 • Nitrate of Soda • Sulphate of Ammonia

When you purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen prod-

ucts on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

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This is the seventh in a series of articles covering various aspects of the fertilizer dealer-farmer survey made by the authors.

the Critical Role of FERTILIZER KNOWLEDGE in Fertilizer Sales

by GEORGE M. BEAL, JOE M. BOHLEN and LARRY CAMPBELL

The successful fertilizer dealer must have an increasing amount of knowledge about fertilizer and its use. He must have this information because his increasingly discriminating fertilizer customer is becoming more and more dependent on the fertilizer information.

This phenomenon is occurring largely as a result of agricultural adjustment—the average Corn Belt state lost 12 percent of its farmers in the last five years; some Southern states lost almost a third. The farmer customers still in business are bigger operators and better businessmen. They recognize that to stay in business they have to farm more and more efficiently. Since fertilizer is one of their major investments and a contributor to much of their profit, they are exerting a constantly increasing pressure on their dealer to be a practical fertilizer expert. That is, they want information from their dealer that will help them to properly apply the right kinds and amounts of plant nutrients, so that their return on their fertilizer investment will be as great as possible.

Thus, the dealer has to possess and implement two equally important types of information about fertilizer if he is to effectively compete for the rapidly growing fertilizer market. They are:

1. Knowledge about the profitability to the farmer of using various combinations and amounts of plant nu-

trients on specific crops, and on specific soil types. For example, he must be able to tell farmer Joe Smith that he will make the greatest profit from his corn on a certain soil type with specified fertility levels if he uses specific amounts of N, P, K.

2. He must know what combination of fertilizer materials and/or analyses properly applied will allow the farmer to obtain these amounts of plant nutrients at the lowest cost per unit of plant nutrient.

These services involve an investment of time on the part of the fertilizer dealer. Recommendations such as these require first, soil test information in order to have a basis for making proper fertilizer use recommendations; and, secondly, knowledge to recommend a fertilization program to the farmer.

The fact that there is a wide range in fertilizer dealers knowledge about fertilizer and fertilizer use is illustrated by a recent study conducted in Iowa with a random sample of 118 fertilizer dealers. This project was carried out by the Iowa Experiment Station in cooperation with the Tennessee Valley Authority. In this study a knowledge score about fertilizer and fertilizer use was developed in cooperation with the university agronomists. This scale was regarded as one that includes some of the essentials needed by dealers if they were to intelligently advise their farmer customers about fertilizer and fertilizer use. The range of scores was from 0 to 8 on a 10 item scale. The average score was 4.64. The question could be raised, "Is there any relationship between the dealer's level of fertilizer knowledge and the amount of fertilizer sold and the profitability of the fertilizer department?" The answer is, yes.

Highly significant relationships were found between the dealer's fertilizer knowledge and: Volume of fertilizer sold, fertilizer mark-ups, and fertilizer gross profits.

Those dealers that had higher fertilizer knowledge were selling the most fertilizer, were maintaining the highest mark-ups and had the largest gross profits.

However, there is no necessary direct relation between fertilizer knowledge and fertilizer sales. It would seem logical that those dealers with higher fertilizer knowledge must be approaching their business and the merchandising of their product differently than do dealers with a low level of fertilizer knowledge. This was found to be true.

To a highly significant degree more of the dealers with the higher fertilizer knowledge:

Were willing to accept new sales and merchandising techniques.

Saw their role with their farmer customers as consultants on fertilizer matters, rather than just sellers of needed goods and services.

Thought they should make recommendations to their farmer customers about methods of application, analyses and amounts to use.

Took soil samples, sent in soil samples and interpreted soil test results.

Helped the farmer plan his fertilizer program.

Called on farmers to provide fertilizer knowledge.

To a significant degree more of the higher knowledge dealers:

Set up test plots and demonstrations

Held fertilizer clinics

Made direct mailings of fertilizer information to farmers.

Though direct causality can not be established between high knowledge and the factors listed above it would seem logical that the dealer who possesses higher fertilizer

Data in this paper are from Iowa State University Experiment Station Project No. 1352 done in cooperation with the Agricultural Economics Branch, Division of Agricultural Relations, Tennessee Valley Authority. The project is under the co-leadership of George M. Beal and Joe M. Bohlen, professors of rural sociology, Department of Economics and Sociology, Iowa State University. Data are taken from three phases of Project No. 1352. These phases were under the supervision of assistant professor John Harp, and graduate assistants Larry Campbell and Quentin Jenkins. They were assisted by graduate assistants research team members Larry Kasperbauer, Daryl Hobbs and Richard Warren.

knowledge would be better prepared and feel more confident in taking many of these active roles in merchandising his fertilizer.

Those dealers with higher knowledge are not only in a better position to consult with and recommend to farmers regarding fertilizer use, but they are in a better position to pass on fertilizer knowledge to their farmer customers. It is obvious that farmers need additional information about fertilizer and fertilizer use. Given a test on rudimentary knowledge about fertilizer, the average farmer answered only half of the multiple choice questions correctly. However, data from our random sample of 315 Iowa farmers shows that there is a highly significant relationship between the farmers knowledge about fertilizer and fertilizer use and the amount of fertilizer he uses and the intensity of fertilizer use per acre of corn. This generalization holds regardless of size of farm as measured by crop acres—on all sizes of farms, higher fertilizer knowledge is related to both amount and intensity of fertilizer use.

Thirty-four percent of the farmers had never had their soil tested. An additional five percent had not soil tested in the last five years. An additional 30 percent had soil tested only once in the last five years. Thus, it appears that well over half of the farmers have no or only a limited basis for knowing how much fertilizer they should be using. There is a significant relation between knowledge about fertilizer and fertilizer use and having the farms soil tested.

The importance to fertilizer sales of raising the farmers knowledge level may be indicated in yet another way. The 315 farmers in our statewide random sample were given a list of factors that might limit their use of fertilizer and asked to

rank the three most important limiting factors. Table 1 presents the result of this line of questioning.

The role of knowledge in overcoming these limiting factors is apparent. Lack of information was mentioned specifically by 6 percent of the farmers. The economics of fertilizer use is conclusive in demonstrating that fertilizer is one of the most profitable, if not the most profitable, inputs the farmer can use. No other farm input comes out as consistently as the place the farmer could make the most on his next dollar investment. Thus, the largest limiting factor, purchase cost mentioned by 59 percent, can be met head on by the knowledge about the economics of fertilizer use. If the farmer has the attitude and knowledge to think in terms of returns or benefits rather than costs, high returns are on the side of fertilizer use. In fact, one dealer in our study stated he hopes his farmer customers raise the question that fertilizer costs too much. He stated that cost is the easiest objection to refute—on no other limiting factor is there so much and such clear cut evidence available to refute this objection. The same can be said for low return on capital investment, mentioned by 14 percent. It is well demonstrated that the use of fertilizer will reduce risk and uncertainty under many conditions. Further, higher knowledge about fertilizer and its use would also reduce the risk and uncertainty at all levels of use. Thus the second most important limiting factor, risk and uncertainty mentioned by 32 percent of the farmers, can also be turned into a selling point with increased knowledge. Dissatisfaction with past experience and many of the problems of handling and applying could also spring from lack of knowledge about fertilizer, and how to apply and use it. The landlord

as a limiting factor can also be met with proper education and information about the economics of fertilizer use. In fact, many dealers are finding that meeting with the renter and landlord (or his farm manager) together has proven a valuable setting for communicating the economics of fertilizer use and usually leads to increased sales of fertilizer. In similar fashions basic knowledge about fertilizer and fertilizer use can be used to counter a number of the other limiting factors mentioned by farmers.

Most farmers expect their dealers to be a reliable source of information about fertilizer and fertilizer use and make recommendations on the basis of that knowledge edge.

96 percent of the farmers said they thought their fertilizer dealer should be a reliable source of information about fertilizer

79 percent of the farmers said they expected their dealer to recommend the method by which they should apply fertilizer

69 percent said they expected their fertilizer dealer to recommend the analysis to apply

60 percent of the farmers said they expected their dealer to recommend the amount of fertilizer to apply.

Those farmers using higher amounts of fertilizer seem to be especially conscious of the importance of "information type" services. More of the high level users, when compared with lower level users, mentioned the following services as being important to them: calling on farmers to check fertilizer use results, fertilizer clinics, and demonstrations, mailing in soil samples and interpreting soil test results and long-range fertilizer program planning. And what is more practically important the larger volume farmer fertilizer users were buying their fertilizer from dealers offering the following "information type services:" fertilizer clinics, taking and sending in soil samples, interpreting soil test results, calling on the farmer with fertilizer information, checking fertilizer test use results and long-range fertilizer planning.

The offering of these "information type" services appears to be very important in the farmers decision in choosing his fertilizer dealer. Sixty-nine percent of the farmers stated that there were services offered by dealers that were important enough to them that they would change dealers to get those services.

(Concluded on page 51)

Table 1. Farmer Perception of the Three Most Important Factors Limiting Their Use of Commercial Fertilizer

Factor	Percent checking item as one of three most important limiting factors
1. Purchase cost	59
2. Risk and uncertainty in use	32
3. Lack of necessary application equipment	25
4. Low return for dollar investment	14
5. Problems with handling and applying	12
6. Landlord	12
7. Dissatisfaction with past experience	11
8. Not enough information about fertilizer	6
9. Use manure	6
10. Use all I need	6
11. Credit	5
12. Good green manure and rotation	4
13. Lack of time	2

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Join the switch to modern, low-cost Capcote PE.

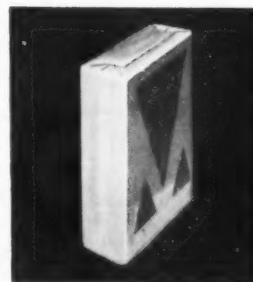
Why use outdated moisture-barrier bags when you can get superior protection at a lower cost with St. Regis® Capcote® PE?

Capcote PE moisture resistance can't be matched. What's more, it provides greater cold-weather strength and pliability, plus increased resistance to acid and alkali. No wonder Capcote PE is the choice of economy-minded packagers throughout the country.

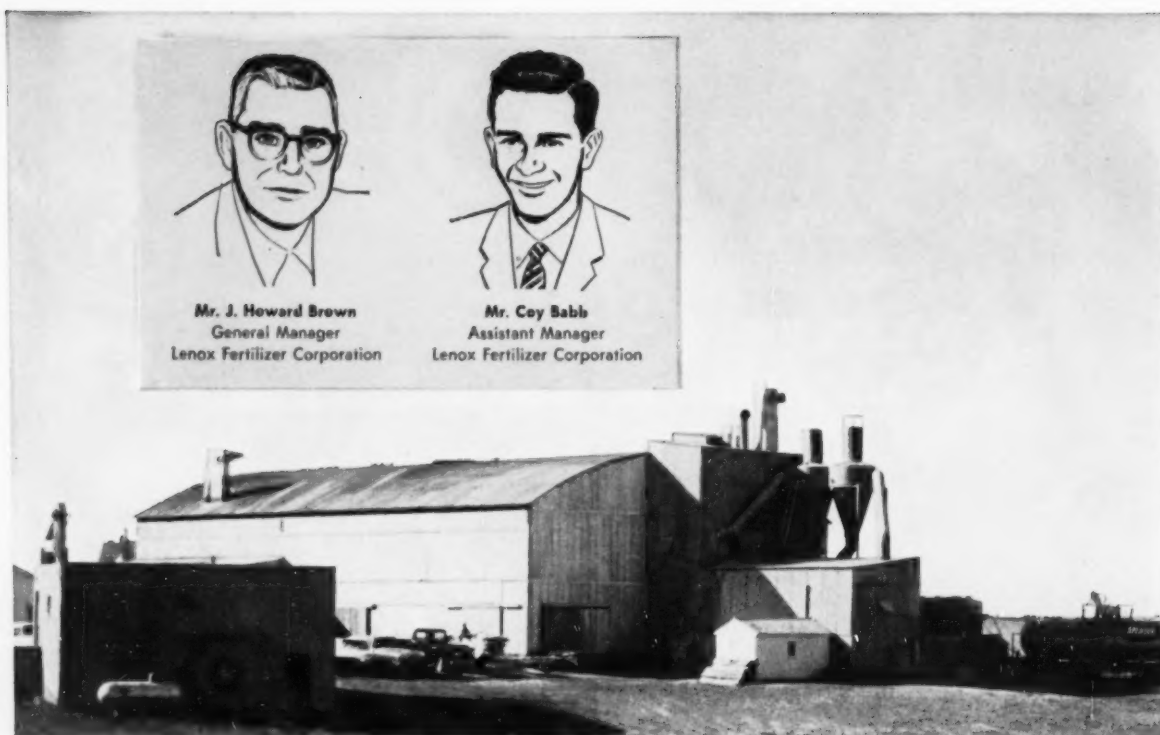
In the last 4 years, the use of PE in fertilizer packaging has nearly tripled, and the

big swing came last year with the introduction of Capcote PE. So join the switch from less efficient moisture-barrier sheets to top-quality Capcote PE.

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The modern granulation facilities of Lenox Fertilizer Corporation are housed in this plant at Lenox, Iowa.

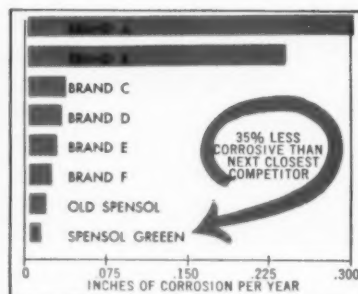
Why Lenox Fertilizer Corporation Gets Better Corrosion Control With SPENSOL GREEN*:

A leader in the manufacture of chemically-compounded fertilizers, Lenox Fertilizer Company (above), was one of the first to produce 20-10-5 without the use of a pre-neutralization process. This progressive manufacturer of XL-s brand fertilizer began operation in 1954. Like many other experienced fertilizer producers, Lenox controls costly corrosion damage by specifying SPENSOL GREEN, the non-corrosive ammoniating solutions.

Corrosion control pays off big by reducing maintenance cost and extend-

ing the life of your manufacturing equipment. Even though you can't see the damage being done, corrosive solutions cost you money daily. When corrosion causes tanks, pipe lines or boot tanks to suddenly give out, down time, parts and repair bills can be mighty expensive.

It costs nothing extra to get greatly improved corrosion control—just specify genuine SPENSOL GREEN ammoniating solutions with the advanced corrosion inhibitor proved to be at least 35% more effective (see chart at right).



Cut corrosion costs at least 35% by making your next order genuine SPENSOL GREEN! Contact your Spencer representative right away.

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Materials availability report:

THE FERTILIZER SITUATION

1960-61

a report by

HAROLD H. SHEPARD, in charge

JOHN N. MAHAN, fertilizer specialist

CHARLOTTE A. GRAHAM, administrative assistant

Agricultural Chemicals Staff of Commodity Stabilization Service

Food and Materials Division, U. S. Department of Agriculture

March, 1961

Supplies of fertilizers for 1960-61 are expected to total 8,293,000 tons of plant nutrients—nitrogen (N), phosphate (P_2O_5) and potash (K_2O)—an increase of 4 percent over 1959-60.

This report reflects the optimism of the fertilizer industry at a time when activity is at a reduced level in many other sections of the economy. Estimates in this report, however, are based on stock trends, rates of production and foreign trade during the first six months of the fertilizer year in relation to the same period in other years. If these estimates are as realistic as they seem, a tight supply situation might arise this season because production schedules usually are not flexible enough to meet a sudden upsurge in fertilizer shipments. Changes in agricultural legislation or programs could have an effect on fertilizer trends.

Incredibly large quantities of fertilizers move to farms in a growing number of forms during an extremely short planting season. Weather conditions determine the start, interruptions, and even close of the season. Handling and transportation facilities become loaded to the limit. Timing influences farmer's preferences for particular kinds and forms of product. Spot orders result from unanticipated needs and many of these may remain unfilled during the busiest part of the season. More than at any time since the early 1950's, farmers this year would be wise to place their fertilizer orders well in advance of application to assure themselves of supplies of specific products.

Nitrogen

Supplies of nitrogen for fertilizers for the 1960-61 year are expected to total 2,964,000 tons of N, up 4 percent over the record 1959-60 supply (table 1).

Production of anhydrous ammonia and fertilizer grade ammonium nitrate solution—basic nitrogenous materials—is again at record levels. Separately, in combination, or one or both supplemented with urea, these constitute about 60 percent of the total domestic nitrogen supply. A 6 percent larger supply

of anhydrous ammonia for direct application and use in mixed fertilizers is expected to be available this year. Exports of ammonia are expected to increase 40 percent over 1959-60. The supply of nitrogen solutions will rise nearly 4 percent, with imports expected to double. Some increase in exports of solutions is included in the figure for "all other" nitrogen.

About 5 percent more solid ammonium nitrate will be available than a year ago due to increases in production and imports, and further curtailment of exports.

Ammonium sulfate production was down about 69,000 tons of N content in 1959-60 from the previous year due to the steel strike and decreased synthetic production. Yet June 30, 1960, inventories of primary producers totaled 195,736 tons of material against 72,342 tons at the previous year's end. In the current year, by-product ammonium sul-

Table 1. NITROGEN: estimated supply of nitrogen for fertilizer purposes, 1959-60 and 1960-61, United States and possessions (1,000 short tons of N)

Item	1959-60 ¹	1960-61
Supply from domestic sources		
Solids:		
Ammonium nitrate ²	433	456
Ammonium sulfate ²	294	303
Urea	110	120
All other solids	256	302
Total solids	1,093	1,181
Liquids:		
Ammonia (including aqua)	841	891
All other	809	837
Total liquids	1,650	1,728
Total (solids and liquids)	2,743	2,909
Imports		
Ammonium nitrate	52	73
Ammonium sulfate	54	32
Urea ²	12	18
Ammonium nitrate-limestone mixtures	26	20
Sodium nitrate	73	70
Nitrogen solutions	6	12
All other	75	65
Total	298	290
Exports		
Ammonium nitrate	21	8
Ammonium sulfate	51	49
Urea	16	32
Ammonia (including aqua)	66	92
All other	34	54
Total	188	235
NET DOMESTIC SUPPLY	2,853	2,964

¹ Revised.

² Adjusted for estimated quantity going into non-fertilizer uses.

fate production is lagging behind normal levels because of reduced output of the steel industry's coke-oven, while producers of synthetic are operating only at about the same level as last year. Production plus stocks, however, should provide about a 3 percent increase in domestic material. Indications are that ammonium sulfate of exact specification as to granule size, etc., is in tight supply. This may reduce the competitive position of other ammonium sulfate because imports in the first half of the year lagged and exports were about the same. These circumstances may encourage shifts to other forms of nitrogen.

Urea production was down about one percent during the first half of the year but is expected to pick up during the second half. Imports were up about 50 percent; however, it is estimated that less than 40 percent of imported urea goes for fertilizer even though it is imported under that classification. Exports during the first five months of 1960-61 were about $3\frac{1}{2}$ times those of last year; prospects for the last half of 1960-61 indicate urea exports for the whole year will be about double those of a year ago.

Increased production of ammonium phosphates, nitric phosphates and ammonium nitrate-limestone is

expected to raise other unspecified solid nitrogen carriers 16 percent over last year.

Anhydrous ammonia capacity continues to grow through expansion of existing plants and construction of new ones. About 453,000 tons of N capacity will be added to the present 4.3 million when six new plants are completed. In addition, a number of other plants are being expanded or have expansions scheduled for over 160,000 tons of N.

Phosphate

Domestic supplies of P_2O_5 for fertilizers in 1960-61 are expected to be 2,842,000 tons, 4 percent more than in 1959-60 (table 2).

Supplies from domestic production will be up 5 percent but imports will show little change and exports will probably be up 15 percent.

Normal and enriched superphosphate supplies are expected to be down 5 percent from 1959-60. Exports are likely to drop 25 percent.

Concentrated superphosphate production will be up over 10 percent. Heavy exports in the fall are expected to taper off to a 7 percent increase for the year.

Shipments of ammonium phosphates by primary producers will be up 28 percent over 1959-60. Imports are expected to be about the same as last year. Exports will probably be more than double those of last year and leave a net gain of less than 40,000 tons of P_2O_5 .

Supplies of all other phosphates will increase 11 percent. Wet-process phosphoric acid production is at a record level—220,000 tons of P_2O_5 over last year. Furnace acid is up 10,000 tons of P_2O_5 . Use of phosphoric acid for direct application and in liquid and solid mixed fertilizers in 1959-60 totaled an estimated 170,000 tons of P_2O_5 .

A share of the extra phosphoric acid will go into increased production of concentrated superphosphate, ammonium phosphates, and nitric phosphates with some acid available for expansion in direct application and use in mixing plants. Indications are that there is a softening in the non-fertilizer market for furnace acid which will result in additional acid from this source going to the fertilizer industry.

Scheduled construction and expansion in the period 1960-62 (some of which is now on stream) will swell wet-process acid capacity 46

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percent above the January 1, 1960, level of 1,348,300 tons of P_2O_5 . Concentrated superphosphate capacity will be increased more than 25 percent and ammonium phosphate capacity will become nearly double that existing on January 1, 1960.

Potash

Potash supplies for fertilizers in 1960-61 are expected to total 2,486,000 tons of K_2O , up 4 percent over 1959-60 (table 3).

Domestic deliveries of potassium chloride (muriate) to the States during the first half of the year were off 20 percent from the same period last year. Movement during the spring season is expected to bring the total for the year ahead of 1959-60. Potassium sulfate is expected to be up 4 percent over last year.

Imports of muriate will be down 10 percent and potassium sulfate down more than 25 percent from last year. Mixed fertilizers and other potash carriers are expected to continue at 1959-60 levels.

Even though a record production was attained last year, a record domestic and export movement reduced stocks to 73,000 tons of K_2O on June 30, 1960, whereas stocks had been 473,000 and 261,000 tons respectively in 1958 and 1959. Deliveries in 1960-61 must come from current production; hence a seller's market appears to be developing in potash.

Exports of potassium chloride the first five months of 1960-61 were 76 per cent larger than the same period in 1959-60. The rate during the remainder of the year may have to be decreased materially because anticipated needs at home are nearly equal to current production. As a result, exports for the year are likely to be reduced to 11 percent below 1959-60. World supplies reportedly have been reduced by a slowdown strike at French mines and by a mechanical breakdown at a Spanish mine. Because of the world supply situation U. S. producers have a more favorable export market but may not be able to take full advantage of it because of domestic needs.

Three producers have expansions under way. One producer is building a plant in Utah, scheduled for completion in late 1962, that will increase U. S. potash production capacity over 25 percent.

The first potassium nitrate plant in the United States directed to the

Table 2. PHOSPHATE: estimated supply of P_2O_5 for fertilizer purposes, 1959-60 and 1960-61, United States and possessions
(1,000 short tons of available P_2O_5)

Item	1959-60 ¹	1960-61
Supply from domestic sources		
Normal and enriched superphosphate	1,329	1,264
Concentrated superphosphate	916	1,019
Ammonium phosphate ²	232	298
All other ²	351	384
Total	2,828	2,965
Imports		
Ammonium phosphate	56	56
All other	26	25
Total	82	81
Exports		
Normal superphosphate	36	27
Concentrated superphosphate	112	120
Ammonium phosphate	20	48
All other	9	9
Total	177	204
NET DOMESTIC SUPPLY	2,733	2,842

¹ Revised.

² Liquid and solid ammonium phosphate shipped as such by primary producers.

³ Includes ammonium phosphate (produced in combination with potash salts to make mixed fertilizers), nitric phosphates, sodium phosphate, wet base goods, calcium metaphosphate, natural organics, phosphate rock and colloidal phosphate, basic slag, and estimates of wet and furnace phosphoric acid for liquid and solid mixed fertilizers and direct application.

Table 3. POTASH: estimated supply of K_2O for fertilizer purposes, 1959-60 and 1960-61, United States and possessions
(1,000 short tons of K_2O)

Item	1959-60 ¹	1960-61
Supply from domestic sources		
Potassium chloride	2,383	2,455
Potassium sulfate ²	127	132
All other	20	20
Total	2,530	2,607
Imports		
Potassium chloride	219	200
Potassium sulfate ²	39	28
All other	24	25
Total	282	253
Exports		
Potassium chloride	395	350
Potassium sulfate ²	15	15
All other	8	9
Total	418	374
NET DOMESTIC SUPPLY	2,394	2,486

¹ Revised.

² Includes sulfate of potash-magnesia.

fertilizer market is scheduled on stream in late 1961.

Bringing two facilities in Canada

into production will add 760,000 tons of K_2O capacity to potash facilities in North America.

Chemical Manufacturers Prove Confidence in Future

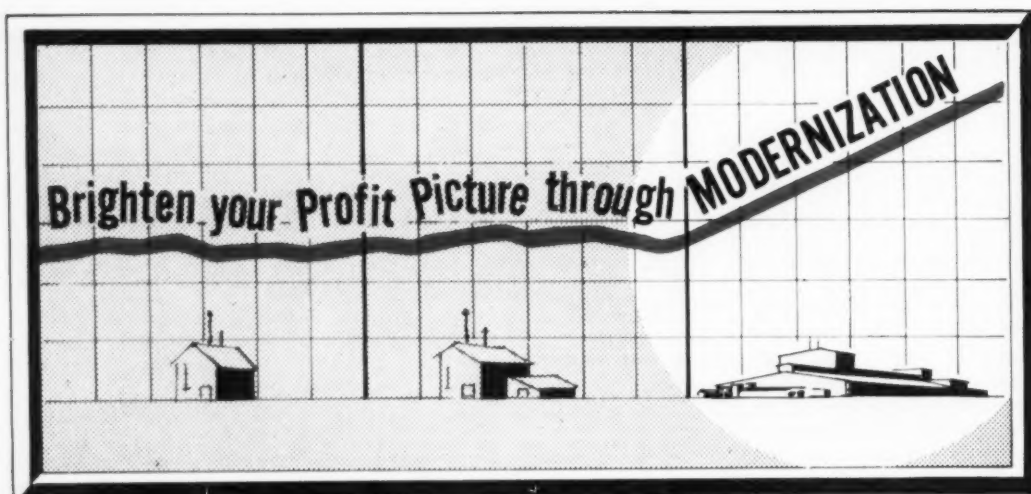
Chemical manufacturers' confidence in the national economy in general and in future demand for their products is emphasized in the Annual Construction Survey released by the Manufacturing Chemists' Association, Inc.

The survey reveals that for the years 1960-61 companies which manufacture chemicals, both with and without the chemical industry proper, constructed, are building or are planning to build facilities estimated to cost \$3,551,030,000. This is the second highest total ever reported by the MCA.

Soviet Chemical Engineering Reports to be Translated

Chemical engineers of the United States will soon be able to read technical papers written by their colleagues in Russia, Eastern and Central Europe and China, which are now inaccessible because of the language barrier.

In a new quarterly journal to be published by the American Institute of Chemical Engineers (A.I.Ch.E.), the best work in chemical engineering being done in Russia and the East will be translated. The journal, scheduled for publication in October, 1961, will receive financial aid from the National Science Foundation.



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is

Materials Standardization *desirable?*

by E. D. KINGSBURY

Before we can discuss standardization of materials, we must first ascertain what products are most advantageous, taking into consideration all facets of production, costs, and the distribution of plant food within the product. We must, it seems to me, justify our present selections of granular, coarse or standard material and then recommend changes that we would like to see made. If we can agree in the main, standardization should be no problem.

Now to discuss potash, and a few mechanical changes that have influenced our thinking regarding particle size.

Using granular potash in low nitrogen grades aggravates separation in the screen ranges with respect to phosphate and potash, while nitrogen is relatively constant. The end product will be high in K_2O in those ranges closely approximating the size of the potash. If we were to select granular potash for low nitrogen grades, we should screen our end product approximately $-4 + 14$ to minimize separation. Formula costs, as many of us know, can be minimized and production rates maximized.

Using coarse potash follows the same pattern, but to a lesser degree. We feel that if this selection is made an end product approximately $-6 + 16$ should be maintained.

With standard potash, there is less separation in the screen fractions; however, there is a tendency to build up potassium in the recycle. In addition, a wider screen range may be necessary, such as $-8 + 24$, and this within itself promotes a degree of separation.

A few manufacturers have done an excellent job of controlling plant food distribution using standard potash in low nitrogen grades, but we note that when deficient, potassium is consistently low; moreover, in 12-12-12 where almost all manufacturers are using standard, there is still a great deal of separation between P_2O_5 and K_2O .

Since 1956 we have developed a

gear reduction for our weigh-belt to increase accuracy, co-ordinated solid and liquid flow with an electric timer, developed a new sparger, and will soon complete our transition to electromagnetic meters. We feel that these improvements have a direct bearing on the selection of raw materials used in manufacturing.

With the advent of the O. K. sparger (O'Neill-Kingsbury), we have been able to increase our flexibility in formulation. We can, merely by turning valves, effect a difference in plasticity equivalent to 200 lbs. of water per ton. Three pipes under the bed and two on top have replaced the conventional T.V.A. design. Potentiometer readings taken at many locations under the bed indicate good distribution of the liquid phase, especially with regard to minimizing temperatures throughout the complete mass. This new sparger, as you would expect, has allowed us to decrease the particle size of the potash used, if we so desire.

Currently we are trying to "have our cake and eat it too." Since we produce granular fertilizer for two plants, 30 tons per hour of end product becomes necessary on some grades during the height of the season. Coarse potash is used in low liquid phases, combinations of coarse and standard in medium liquid phases, and standard in high liquid phases.

In an effort to improve our product chemically, as well as physical-

ly, we have recently changed to 7 and 8 mesh tyrod screens on the top, and 14 and 16 mesh on the bottom to effect an end product that will screen 95% $-6 + 16$.

Separation of particle size within our bins has been greatly reduced by new "desegregators." Small reversible belts traveling 800 feet per minute are minimizing the cone pile. This, we feel, will go a long way towards offsetting the disadvantages of using coarse potash.

In an effort to re-examine the separation of plant food within the end product, we have, for the past three months, been sampling the 6-10 range and the -10 range for nitrogen, phosphate, and potash. While there are still fluctuations in plant food, improvements have been made. In addition, samples received from the state this fall tend to confirm our hopes that we can "have our cake and eat it too," provided there are adequate controls.

Now what do we want, or more correctly what do we *think* we want with respect to particle size and where do we think improvements can be made?

In our opinion, there has been an effort on the part of potash producers to standardize their coarse material. 100% through an 8 mesh, 20% on a 10, 40% on a 12, 60% on a 14, 80% on a 16, 100% on an 18 is, we feel, ideal, and some companies are approximating these specifications. If you move the screen size up 2 mesh, for a final product, theoretically at least, you will have 50% of the potash in the 6-11 range and 50% in the 11-16 range. Currently our end product is running a little higher than 50% in the 6-11 fraction, but if we use a potash with too high a percentage held on a 10 mesh, problems of coverage occur.

Differences between refining processes are not significant with regard to granulation in our system. There is, however, a significant difference in the amount of dust contained in various products, and we note that some producers exercise better control over particle size throughout the season than others.

One company is producing an al-

The author is vice president of Kingsbury & Co., Inc. at Indianapolis, Ind. The company manufactures normal superphosphate and granular mixed fertilizers at Indianapolis, and granular mixed goods at a second plant in Peru, Ind. Mr. Kingsbury presented this paper as a member of a Users' Panel on Raw Materials Standardization at the Fertilizer Industry Round Table technical conference last November. Your editors have withheld publication of this paper pending release of the Round Table proceedings, which were released late last month.

most dust free grade of potash with the approximate specifications: 5% 10-16, 10% 16-20, 75% 20-32, and 10% -32. We believe that this, at least with present formulas and equipment, is an ideal standard grade. With the replacement of 5-20-20 and 4-16-16 by 6-24-24, requirements for coarse potash will probably be reduced. In the near future then, we suggest that more dust free standard be considered with the approximate specifications previously mentioned.

With regard to phosphates, I shall limit the discussion to normal super, triple, and phosphoric acid.

Superphosphate is manufactured at our Indianapolis plant, with 77 BPL rock and virgin acid. After experimenting with various Baume inputs, we have settled on 607 lbs. of 100% H_2SO_4 to 1000 lbs. of rock, utilizing 56½% Be acid.

This, we feel, is the highest degree Be. that can be used without producing an excessive amount of small pellets. Tests of ex-den super averaged for this spring: 8.2% moisture, 19.9 available, 1.1 insoluble, and 3.0 free H_2SO_4 . Starting the cut acid into the pan before the rock, and dropping the batch just prior to the top of the rise, has promoted optimum honeycomb. Screen analysis of the super prior to going into the ammoniator is approximately as follows: 2% on a 6, 10% 6-10, 10% 10-16, 12% 16-20, 20% 20-32, and 45% -32. Ammoniation rates are calculated at 6%.

We have used coarse triple in certain formulations containing nitrogen, but due to low ammoniation, we have standardized on R.O.P. Run of pile triple produced today, we feel, needs to be improved. Screen tests on a recent car showed that 60% passed through a 35 mesh screen. It's too bad we didn't have a 325 mesh screen at the time. It is not the -35 but rather the -100 and -200 mesh material that is causing the dust problems. If the vice-presidents in charge of triple production were required, as a part of their training, to unload one of these cars, I'm sure changes would be made rapidly. We would like to suggest, therefore, that producers remove these very fine particles just prior to loading.

In addition, standardization of triple specifications between producers is lacking. Summarized screen analysis of three triple cars received recently are as follows:

39.3	-6 +16, with 53.8%	-20
22.9	-6 +16, with 71.5%	-20
13.2	-6 +16, with 78.5%	-20

While these specifications do not represent an arithmetical average of the products, they do, nevertheless, indicate a lack of uniformity between producers. Moreover, there is a lack of standardization between products manufactured by the same producers. Part of this problem is probably due to the old culprit "pile separation," and while a cure for this problem will be difficult, improvement should be made.

The first triple car mentioned contains, in our opinion, too much material in the -6 +16 range; the second was not a bad car—fine, but not too much dust; the third one we should have saved for that vice-president.

If moistures can be held to 4 to 5%, the 6-16 range held to 20%, and the dust held down there in Florida, we can ammoniate to 3.5 or 4% and still live with the "stuff."

Several years ago we made a few experimental runs using wet process phosphoric acid with a water content of approximately 30%. While this material was satisfactory in a 1-4-4 ratio, it did not lend itself to 1-1-1 ratios. Due to high water content, slightly better distribution was accomplished in 4-16-16 and 5-20-20 runs, but this was more than offset with the problems created when manufacturing 12-12-12. Trial runs using electric furnace acid have also been made, but due to the higher water content and purity of the product, granulation was more difficult. We have concluded that if the water content can be held to 19%, the material is satisfactory, but water content below 19% are desirable in some ratios. High analysis acids, with about 15% water are preferred in high liquid phase grades.

So long as we can pump the material out of the tanks, purity of the acid is relatively unimportant; however, we have received our share of tanks that have been returned, minus about 12 to 14" of stand pipe, and as Joe Prosser would say, "This is not good."

Since we do not have storage facilities for phosphoric, the problems of handling a tank testing 52% and one testing 55% are minimized, and with a few exceptions viscous material has not been a major problem.

Diammonium phosphate was used experimentally a few years ago, and efforts were made to determine product breakdown at that time. According to results obtained, no appreciable loss was incurred; however, inputs were held to 300 lbs. per ton, and temperatures were not

allowed to become excessive.

With regard to sulphate, we feel that there is one outstanding product produced in the east. It is, in our opinion, the only consistently free-flowing material that we have used in our plants. Sulphate that has been kiln dried is usually superior physically to that which has been dried in a centrifuge.

In discussing standardization of solutions, we have assumed that reference should be made to the number of solutions on the market and not the differences in specifications between suppliers offering the same solution.

We, like many other companies, have experimented with a number of solutions. In the fall of 1958 and spring of 1959, we were using 440 (22-66-6). Following is a summary of our observations:

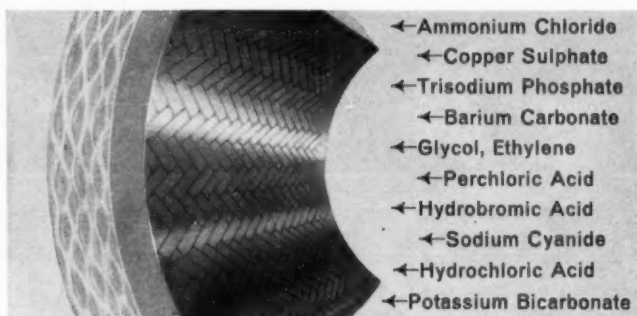
1. Given the same end-product moisture content, a 1-1-1 ratio made with a 5% urea solution reduces the pile set by as much as 50%.
2. 1-1-1 ratios can tolerate at least .25% more moisture and still produce less pile set than a straight nitrate solution. This, in our opinion, confirms experimental data with respect to the change in crystalline structure of ammonium chloride.

During that time we experienced a dilemma when drying the product: breakdown of granules with too much heat; and without enough heat, too much moisture in the end product. This caused a shift back to nitrate solutions, and while we have not given up on the use of these solutions, we have, for time being, discarded them until better control can be obtained.

We have used "essentially anhydrous" solutions and consider them superior to other solutions when granulating 1-1-1 ratios, but limited supply, at present, is a factor in their disfavor.

Since we're here to discuss standardization of products, we'd like to muddy the water a bit and suggest that a 433 (22-72-0) solution be produced for the Midwest. This solution could be used about April through September and be the summer component of 448 (25-69-0).

More standardization with respect to solutions is warranted, and many obsolete combinations should be eliminated; however, all of us are on the lookout for better combinations of ammonia, nitrate, urea, and water, and new solutions that are superior to former combinations should not be sacrificed for the sake of standardization.

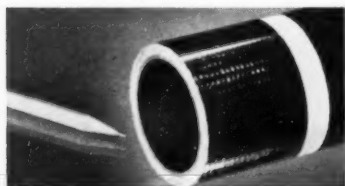


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- *Handles 320 of the 338 most corrosive solutions*
- *Available in pipe sizes from 2" to 8" with fittings*

You see above the dramatic ability of Fibercast pipe to "live with" punishing chemicals without ill effects—without trace of corrosion or scale.



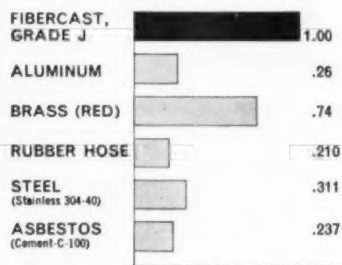
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posits to clog or jam the system, saving downtime, replacement and repair. The Hazen-Williams C Flow Factor of Fibercast is 147.

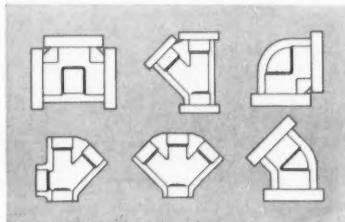
COMPARATIVE LIFE DATA*



*Basing Fibercast as unit life of 1 and others as comparative percentages thereof.

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CALIFORNIA

Don-Mor Garden Fertilizer Co., Inc. has been incorporated in Santa Clara County to manufacture garden fertilizers, by Ephriam Adams, 1661 W. San Carlos St., San Jose. Directors are D. W. McIntosh, M. V. Lowry, William Norton.

ILLINOIS

Allied Chemical has announced production of phosphoric acid from new facilities located at the East St. Louis Works of its General Chemical division.

The plant, with a projected capacity of 50,000 tons per year of high-quality wet process acid, will primarily supply fertilizer manufacturers serving midwest agriculture. General Chemical Division previously furnished a portion of the midwestern area's acid requirements from its plant at North Claymont, Delaware.

According to the company, the new plant will produce "a truly green wet process acid of finer quality than any previously available." This higher quality, it is reported, results from the use of new processing techniques together with selected raw materials, including virgin quality sulfuric acid.



spherodizing process with the French PEC slurry process to achieve a completely homogenous the 'Ortho Unipel' pellet.

Scheduled for completion in the fourth quarter of this year the new Fort Madison plants will develop California Chemical Company, through its Ortho division, as basic producers and marketers of chemical fertilizers in the Midwest and Northeast.

* * *

Cornland Manufacturing Corp., a pioneer granulating plant at Grinnell, has been licensed by Tennessee Valley Authority to use its concentrated superphosphoric acid in the production of high-analysis liquid fertilizers.

KANSAS

Cooperative Farm Chemicals Association's new urea plant at Lawrence has now been in continuous operation since January 1. Chemical Construction Corporation, designers and builders, hail this as "the first successful commercial scale operation of their new, lower cost, more efficient process for the production of urea."

In an address at the American Institute of Chemical Engineers, Lucien Cook, chief engineer of Chemico's urea division, revealed the details of this new process.

The process employs the principle of carbamate solution recycle, which facilitates the complete consumption of the ammonia and carbon dioxide used as raw materials. A simpler operation that requires a minimum amount of equipment, it utilizes only a small quantity of water for the recycle of unconverted ammonia and carbon dioxide. This results in a high concentration of urea product before the evaporation stage.

The new Chemico urea process has a unique method of conserving the heat that results from its operation, and significantly less steam is required than by other methods. The Chemico process also saves on

electric power and cooling water.

Mr. Cook stated that although there are other processes available which also employ the carbamate solution recycle method, the new Chemico process results in a marked reduction in initial investment, lower utility costs, and less maintenance costs.

Also, it provides longer "on-stream" time allowing the plant to run without shutting down for maintenance and adjustments.

MICHIGAN

The Washington Elevator, Washington, owned by Myron Lutchman, has just completed a dry blending plant, the equipment for which was designed and manufactured by the Burton Mixer & Manufacturing Company. The plant is designed to handle bulk or bag goods at the rate of 20 hourly tons.

MISSISSIPPI

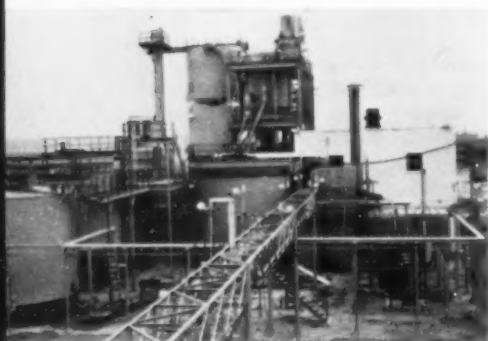
The Riverside Fertilizer Factory Marks, has obtained a license from the Tennessee Valley Authority for the use of process and apparatus for the ammoniation of superphosphate.

MISSOURI

Kilkenny Fertilizer Company, West Plains, is equipped to offer a package deal, or any component of it, including mixes tailored to soil tests, loading farm trucks to order, bagged mixes or field application. The plant, owned by Dean Kilkenny, uses mixing equipment which draws from four 100-ton storage bins to an overhead mixer, which dumps directly into trucks below. There is also limestone storage on the yard.

NEBRASKA

Consumers Cooperative, whose progress was last reported in our January issue, was due to go into construction the first of this month with the \$8,000,000 anhydrous ammonia plant at Hastings. The way for this was cleared when the Federal Power Commission cleared the contract with Kansas-Nebraska Natural Gas



Allied Chemical has announced production of phosphoric acid from these new facilities located at the East St. Louis (Ill.) Works of its General Chemical Division. The plant, with a projected capacity of 50,000 tons per year of high-quality wet process acid, will primarily supply fertilizer manufacturers serving midwest agriculture.

IOWA

California Chemical, Ortho division, a subsidiary of Standard Oil Company of California, has announced the awarding of a contract to the Chemical & Industrial Corporation for construction of a complex dry fertilizer plant at Fort Madison. This unit, one of several chemical plants being built at Fort Madison, will utilize nitric acid acidulation of phosphate rock. The plant has a capacity of 600 tons per operating day of complex pelleted fertilizer.

This new plant combines the C&I

Co., for gas service.

The plant is to be built under the direction of R. R. Zurbuchen, general manager of Cooperative Farm Chemicals Association, and will be built by Chemical Construction Corp. The plant is expected in operation by November, and is to produce 20 daily tons of anhydrous ammonia.

NEW MEXICO

Potash Company of America has awarded to Stearns-Rogers an engineering and construction contract for a \$3,500,000 modernization of their Carlsbad plant. John W. Hall, president of PCA, said that when the work is completed, by the middle of next year, the process will permit processing of ores now bypassed (because of magnesium content), and should extend to at least 16 years the reserves formerly calculated at 10 years.

There will be no significant interruption in production, Mr. Hall stated.

OHIO

Monsanto Chemical now is marketing 105 per cent phosphoric acid from its newly completed plant at Addyston.

The product is 40 per cent more concentrated than normal 75 per cent acid, according to A. Q. Svoboda, product sales manager for Monsanto's inorganic chemicals division, and is called 'Phospholeum' by Monsanto. The acid is a natural desiccant. It is also an excellent agent for rendering inactive many common trace minerals (such as calcium, aluminum and magnesium) which frequently interfere with chemical processing.

The concentrated acid is less corrosive to metals than regular 75 per cent and 85 per cent acids. It can be diluted easily to regular acid strength.

Monsanto also manufactures 75 per cent and 85 per cent acids at the new plant. Neither cost nor capacity of the new plant was announced.

* * *

Aldo Soil Service, Wauseon, which has for some time operated a liquid plant, has now installed dry blending equipment, most of which was supplied by Burton Mixer & Manufacturing Co.

TENNESSEE

The Nitrogen Products division of W. R. Grace & Co. is on stream with 60,000 tons of new ammonia capacity at its Memphis plant, William J.

Haude, division president announced March 13.

The new capacity, completed just before the peak of the fertilizer use season, brings the overall ammonia capacity of the nitrogen plant to more than 160,000 tons annually.

The additional ammonia capacity will go to satisfy in-plant requirements of the raw material for urea production, and outside to customers who have increased their consumption of ammonia.

Until now, the urea production facility which adjoins the ammonia plant had to obtain a portion of its ammonia requirements from outside sources. Urea capacity, originally 50,000 tons a year, was doubled in 1959 making the Memphis plant the third largest urea tonnage facility in the U. S.

The new plant employs the steam reacted with natural gas to produce hydrogen. This in turn is combined with air and purified to form synthesis gas which is converted to ammonia.

TEXAS

Bemis Bro. Bag Company has announced for Houston construction of a new 200,000 square foot plant to make paper, textile and open mesh bags.

The new one-story facility will occupy an 18-acre site in northwest Houston. Ground will be broken in late spring, with completion anticipated for late fall and full operation scheduled by the end of the year. Cost will approximate \$1,400,000, not including machinery and other contents.

The plant, which will cover approximately five acres, is engineered to give maximum flexibility for future enlargement, according to Judson Bemis, company president. It consolidates and expands the company's manufacturing operation in the Texas city, which currently is conducted in two separate factories.

* * *

Diamond Alkali expects their Deer Park ammonia plant to be in production early next year. Monsanto will market the ammonia.

* * *

Tenneco Chemical has been formed by Tennessee Gas Transmission of Houston to build and operate on the Houston Ship Channel a petrochemical complex to cost more than \$100,000,000. In addition to other chemicals from natural gas, the plant will produce ammonia from by-product gas.



The Nitrogen Products Division of W. R. Grace & Co. is on stream with 60,000 tons of new ammonia capacity at its Memphis, Tenn. plant, William J. Haude, division president announced March 13. The new capacity, completed just before the peak of the fertilizer use season, brings the overall ammonia capacity of the nitrogen plant to more than 160,000 tons annually.

UTAH

Bonneville Ltd., Wendover, has from the Kern County Land Co. of San Francisco an offer to acquire their operation. While the original offer was turned down, the directors are still in a mood to listen further. Bonneville is a producer of solar-evaporation potash, and has recently increased capacity that will make a substantial rise in production, the exact figures depending on the solar season.

Kern County Land Co., as we reported to our readers last month, has recently been exploring phosphate and trona deposits in Wyoming.

VIRGINIA

Bone Dry Fertilizer Co., Inc., an established fertilizer plant in Richmond, has now been incorporated for \$100,000.

CANADA

Consolidated Mining and Smelting has begun shipment of urea from their \$5,000,000 Calgary plant which has a capacity of 100 daily tons.

Pictured below is a drawing of the new \$1,400,000 plant which Bemis Bro. Bag Co. will build at Houston, Texas this year to consolidate and expand their operations there.



—Around the Map...



Canada's Finance Minister Donald M. Fleming (left) receives a golden bolt from Thomas M. Ware, president of International Minerals & Chemical Corporation, signifying the opening of Canada's potash deposits to world markets in fiscal 1961-62. Looking on (center) is Dr. C. F. Wilson, consul general of Canada in Chicago.

The bolt is a golden replica of one used late in March to complete a 3,500-ton cast-iron lining inside the company's shaft at Esterhazy, Saskatchewan.

CANADA (continued)

Potash Company of America expects the cementation of their mine shaft at Saskatoon, Sask. to be completed by September, but John W. Hall, company president, said that no statement could be made at present regarding the schedule for resumption of potash production there.

Continental Potash has made everything ready to penetrate the Blairmore zone on the property near Unity, Saskatchewan. The shaft is already 1711 feet down, lined with

concrete and with a pad of concrete as a base for the penetration of the crucial 360 feet.

BELGIUM

Societe Industrielle Belge will undertake a 2-year program to cost some \$30,000,000 and provide units which will recover some 60 daily tons of sulphur, increasing the potential output of liquefied petroleum gas. The plant, in Antwerp, is expected to be in operation by 1963. It is owned jointly by British Petroleum and Petrofina.

INDIA

Nangal Fertilizer Factory moved February 24 its first 'wagonload' of calcium ammonium nitrate. The plant occupies a 500 acre site, cost Rs 30 crores and is the largest single industrial unit in the Punjab. It is designed to produce 1200 daily tons, but is receiving now only half the KWs of power required to meet this schedule.

...

International Minerals & Chemical Corporation and **California Chemical Company**, along with **The E. I. D. Parry group**, Madras, South India, have been granted a license by the Indian government to construct a proposed \$51,000,000 fertilizer plant

on the east coast of India, which would produce about 350,000 annual tons of chemical fertilizers.

With the granting of the license, complete feasibility studies on the proposed operation will be undertaken. The individual companies will make their final decisions as to participation on the basis of these studies and after further discussion with the Indian government. Present plans call for construction of the Indian plant in the port city of Visag, near a Caltex oil refinery which will supply some of the major ingredients used in the fertilizer manufacturing process. Caltex is a Standard of California affiliate, as is California Chemical.

Completion of the Visag project, expected in 1963, will coincide with the third year of India's current five-year plan, in which principal emphasis is on food production. To feed a population which is expected to exceed 450 million by 1966, India has taken urgent action to improve food production capacity.

INDONESIA

The Government has contracted with **Morrison-Knudsen**, Boise, Idaho, to design and build a \$38,000,000 urea plant at Palembang. It will be rated at 100,000 annual metric tons, from natural gas to be piped in from nearby fields. M-K will operate the plant during a training period and will handle the training of local personnel. Subsidiary **H. K. Ferguson** and **Girdler Construction** will be associated with M-K. Construction is due to start at once.

ISRAELI

Israeli Mining Industries and Fertilizers and Chemicals, Tel Aviv, are thinking about jointly building a plant to produce highly concentrated phosphoric acid. Israeli chemists developed the process.

NETHERLANDS

Mekog (N. V. Maatschappij Tot Exploitatie Van Kooksoevengassen) has contracted with the **Societe Belge de L'Azote et des Produits Chimiques du Marly (S.B.A.)**, Liege (Belgium), for the engineering of a unit for the neutralization and concentration under atmospheric pressure, of ammonium nitrate solutions.

This unit, applying S.B.A.'s technique will be erected at Pernis and will have a daily capacity of 285 Tons of ammonium nitrate 100%.

S.B.A.'s ammonium nitrate producing process is already applied by Mekog in its works, and is utilized in S.B.A. works as well as in numerous plants which the latter company developed for foreign firms.

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Portable Bulk Scale

Only one man is needed to load, weigh, transport and discharge bulk materials with a new, low cost, bulk scale conveyor manufactured by Suttle Equipment Corporation.

Model No. 1200 'Eze-Move' Bulk Scale, 1000-pound-capacity conveyor can accurately measure bulk materials within one ounce. Equipped with an accurate Fairbanks-Morse scale (f.o.b.), this conveyor eliminates the need for special stops at floor scales, or the necessity for built-in scales at the hopper.

The hopper has a capacity of 18 cubic feet and will handle from 500 to 1000 pounds of various materials. This conveyor bin is electrically welded of heavy 14 gauge steel with sharply sloping sides to provide complete gravity discharge.

Even when fully loaded, the Suttle Bulk Scale moves easily on its 10-inch rubber-over-steel wheels and 6-inch roller bearing swivel casters.

The dump gate is 8 x 10 inches in size, and is controlled by an extension handle at the rear. The two-wheel foot brake, the scale, the dump handle, the pushing handle are all within easy reach of the operator from one position.

Other models of the Suttle Eze-Move Bulk Scales are available with capacities up to 2000 pounds.

Further information, specifications and quotations may be obtained on these products by circling number 1 on CF's Information Service card, page 39.

Super-Vibrators Brochure

Martin Engineering Company, originator of the 'Vibrolator' line of vibration inducers, is offering a new 4-page folder, 'Big Shake Bulletin 1043.' It describes air, electric, gasoline and hydraulic powered vibrators for use on railroad hopper cars, bunkers, chutes, laboratory testing, foundry shakeout and other applications requiring a vibrator of great power and lightweight. Action photos, drawings, engineering data and prices are enclosed.

For a free copy, circle number 2 on CF's Information Service card, page 39.

new literature about equipment, materials and supplies

Bucket Elevator in Kit Form

Bucket Elevator Company announces availability, from stock, of a newly designed bucket elevator manufactured of rugged, yet light weight, carbon steel and sold in kit form for on-the-job assembly by one or two inexperienced men. Known as the 'Buck-El Lift-It-Kit,' these units are inexpensive and will elevate a wide range of bulk materials at capacities up to 4 CFM.

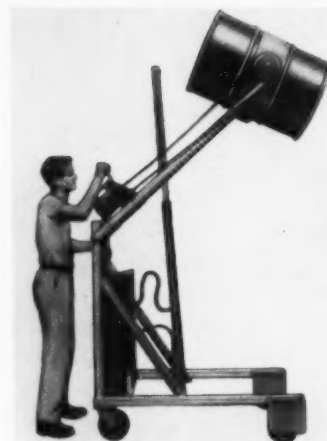
The basic kit includes a bottom section with built-in slide gate; two mid-sections; head section with discharge chute; belt (or chain) and



buckets; drive components with motor optional and all necessary hardware. Discharge height is adjustable from 6' 2" to 8' 2".

Optional equipment includes additional mid-sections for increasing the lift of the elevator, inlet chute, bag loading hopper, motor and attachments and belt guards. Photograph illustrates a Buck-El Lift-It Kit completely assembled.

For additional details, circle number 3 on CF's Information Service card, page 39.



Portable Drum Lift

A new portable power-operated one man drum lift, that raises steel or fibre drums from floor to bung in just 30 seconds, has been developed by demand where there is need to lift drums and empty contents from heights of 7' to 8'.

The lift has the additional advantage of being able to work in areas of minimum headroom and is maneuverable in cramped quarters. With 8" diameter spark proof wheels it is available in AC or battery operated power packs.

For further information, circle number 4 on CF's Information Service card, page 39.

New Automatic Tritator

A new automatic laboratory titrator has just been introduced by Coleman Instruments, manufacturer for chemical analysis. Named the Coleman Titriton, this titrator quickly, precisely and automatically performs any titration in which the end point can be related to a reproducible electrode potential, including pH, redox and conductometric procedures.

The titrator is designed for high speed and accuracy—it provides titrations to accuracies within ± 0.1 pH with elapsed time of only 1 to 1½ minutes, and with an actuation potential sensitivity of only 2 millivolts.

For full information, circle number 5 on CF's Information Service card, page 39.

Hammer Mills and Pulverizers

Availability of an eight page well-illustrated technical catalog on the complete line of Young "Robinson" heavy duty Hammer Mills and Screen Type Pulverizers has recently been announced. Bulletin 49-A presents illustrations and cut-aways on a variety of models. It also includes detailed dimension tables.

A special insert shows a closeup of perforated and wedgewire screens and of both bar and knife type hammers. Application details are also included.

Copies of catalog 49-A available by circling number 6 on CF's Information Service card, page 39.



Fertilizer Trailer Spreader

Calhoun Manufacturing Company has added a Speed-Spud Fertilizer Spreader to its line of farm equipment. Extensively field tested for more than a year and in dealer use on a limited basis, the spreader has been designed for the large farm operator as well as by commercial operators and fertilizer dealers.

The Calhoun spreader was engineered to minimize soil compaction. The unit, with a capacity of 2000 pounds of 60-pound granular fertilizer, weighs only 600 pounds. It can be used in any field where a tractor can operate. It spreads all types of chemical and treated organic fertilizers.

The unit spreads fertilizer in an even pattern up to 40 feet wide. Its propelling fan operates at 650 R.P.M. The feed apron is ground driven with a control clutch from the driver's seat. The feed web is of stainless steel. All wearables parts are replaceable.

Optional equipment includes tarp cover, extension sides for large loads, and gasoline driven drive when PTO is not needed.

For additional information, circle number 7 on CF's Information Service card, page 39.

Dust Collection Bulletin

Buell Engineering Co. has recently issued a four page bulletin describing its complete line of Buell-Norblo dust collecting, recovery, and classifying equipment.

Air pollution, material handling and classification, recovery of material from waste gases, and employee comfort are a few of the broad areas of application.

Copies of the bulletin are available by circling number 8 on CF's Information Service card, page 39.

Versatile Bulk Blending Unit

Versatility was the keynote used in the design of the new 'Big Chief Bulk Blending Unit' manufactured by Fertilizer Engineering & Equipment Company. Of prime importance was the necessity of a unit that could be mass produced for maximum economy, and yet fit into the vast majority of installation sites.

The result of this extensive study accounted for the creation of a three section bulk blending unit. Heading the list of features is the first section, which is a highly compact semi-enclosed unit consisting of a bucket elevator head, screen, pulverizer, walk and railing, hoppers, valves and chute directing the material for numerous different applications.

The second section consists of the elevator intermediates with the height dependant on the type of mixing or blending desired and if bagging and/or further processing is desired.

The third section consists of a dial head weigh hopper with a chute, or, if no pit is desired, feeder screw, to the elevator boot.

For further information on how the 'Big Chief' will custom fit into your particular installation, circle number 9 on CF's Information Service card, page 39.

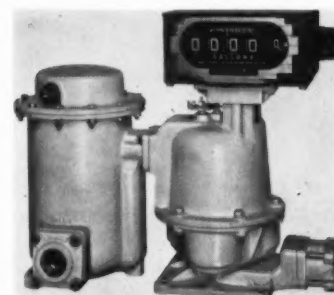
Bulletin Covers New Agricultural Service Pumps

New Bulletin 1538, available from The Deming Company, describes in detail the many uses for which Deming internal gear agricultural service pumps are adaptable, in addition to photographs showing the three different sizes.

Of particular interest to users of this type pump is a section illustrating how the incorporation of each feature gives a distinct advantage to the user.

Also contained in Bulletin 1538 are charts which explain each pump's performance in gallons per minute at various pressures and power requirements, along with dimensions, materials of construction, and construction data.

For a free copy, circle number 10 on CF's Information Service card, page 39.



New Meter for Fertilizers

A new positive displacement type meter designed to measure liquid fertilizer in mixing plants, on delivery trucks and field applicators, has been announced by Tokheim Corporation, veteran manufacturer of pumps and meters.

A self-purging unit, the Tokheim meter is built to handle liquids at speeds up to 60 gallons per minute, and is accurate at any speed within its range, and at any pressure. It is known as the Series 600.

Vital parts of the meter are built of stainless steel, Rulon and other non-corrosive materials which are highly resistant to deterioration from the action of fertilizer solutions. The meter may also be used for measurement of gasoline, water and scores of other common liquids without fear of damage.

The basic model 684-LF consists of the meter with horizontal counter, strainer, air release and back pressure valve. A predeterminer and ticket printer are available if desired. It is also offered with counter alone as Model 682-LF. Counter registers to 10,000 gallons per delivery; totalizer to 1,000,000 gallons. The basic meter has an easily accessible calibration adjustment which assures continuous accuracy.

Series 600 meters carry a one-year warranty against defects in workmanship or material. They are available through Tokheim distributors located in principal cities.

For full information, circle number 11 on CF's Information Service card, page 39.

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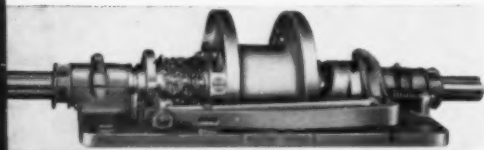
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Automatic Power Shovel For Rail Car Unloading

An improved automatic power shovel, for unloading bulk materials from railway cars or long truck trailers, is announced by Webster Manufacturing, Inc.

Known as Webster No. 40, it is suitable for handling a broad range of dry materials—It can be used with wood, aluminum or steel scoops.

Shovel mechanism (as illustrated) is available in single and double types. It is mounted on a rigid support 10 to 12 ft. above the car door level. Shovel is designed for maximum travel of 35 ft. This can be extended on special models.

Among outstanding mechanism features is an exclusive reversing system, which eliminates need for hazardous counterweights. It is said to provide reliability and safety unavailable in many unloading devices. The centrally-located winding drum is of single direction type. There is no right or left hand mechanism and shovel is said to be easy to install and use. It is also claimed to have 50% fewer working parts than many other unloaders. Weight of the single-unit type is 575 pounds; double unit weighs 1150 pounds.

For a copy of Bulletin 960 describing the unloader, circle number 12 on CF's Information Service card, page 39.

Stainless Steel Lab Sink

From Terriss-Consolidated comes a stainless steel sink fabricated to comply with sanitary specifications. This radius cornered unit is of 18 gauge mirror polished stainless 54" long x 25" deep x 36" high with adjustable legs. It comes equipped with pull-out spray hose and single handle water mixer faucet pouring into a single bowl 20x18x7½" deep. Also featured are pull-out drawers with side and center closets.

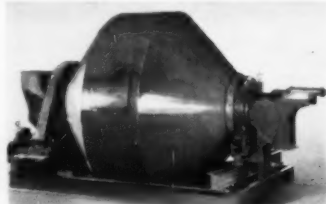
For full information, circle number 13 on CF's Information Service card, page 39.

Rotary Batch Mixers

Rotary batch mixers up to 360 cubic feet capacity now are being offered by Munson Mill Machinery Company. The new, larger mixers also incorporate design improvements for faster batching cycles.

Design changes include larger intake and discharge ports on the 200 to 360 c.f. models. Mixers in these sizes also have re-designed trunnion rollers and weight-carrying trunnion rings made of a wear-resistant grade of Meehanite iron. New type cam locks for the door provide more efficient sealing.

These models also can be equipped with internal indicating devices



to provide for completely automatic mixer operation through remote-controlled intake and discharge. This feature also is optional on smaller Munsons.

Further information may be obtained by circling number 14 on CF's Information Service card, page 39.

High-Efficiency Classifier

Buell Engineering offers reprints of a three-page article which tells how its new high-efficiency classifiers separate small-size particles from coarse material at the American Agricultural Chemical Co.

With the aid of four photographs and three line drawings, the article explains how American Agricultural Chemical uses two new classifiers to end a dust problem, upgrade its end product, and reclaim fine material formerly lost. It describes how the classifiers use air flow to effect near-complete separation, without the aid of moving parts and with no attendance once the separation point has been set.

As covered in the article, 96% of the coarse material collected by American Agricultural Chemical is larger than 100 mesh, and 95% of the fine particles are smaller than 100 mesh. The small amount of

off-size material in each case is very near the "cut" point.

Copies of the reprint may be obtained by circling number 15 on CF's Information Service card, page 39.

Flow Metering Applications Of Differential Producers

B-I-F Industries, manufacturers of primary flow metering elements, has just released a new bulletin, itemizing ten of its Differential Producers, covering a comprehensive range of applications.

Dall Flow Tubes, including the new Dall Plastic Insert, Herschel Standard Venturi Tubes, Venturi Flow Nozzles and the new Plastic Parshall Flume Liner are illustrated and described, showing their specialized applications. Line sizes are available from 1" up.

The 8-page, two-colored bulletin details, with illustrations for each, the products suitable for the metering of water, air or gas, as well as petroleum, alkalies, acids and sewage. High pressure and temperature services are included.

For a free copy of bulletin Ref. No. 100.20-1, circle number 16 on CF's Information Service card, page 39.

Portable Belt Conveyor

A new, economy portable belt conveyor with a hydraulically-powered raising frame has been announced by Finco, Inc., manufacturers of materials handling equipment.

The hydraulic lifting action, with a total stroke of 17½-feet, permits



rapid height adjustment, one-man operation.

The new conveyor features a standard 18" wide belt with a self-toughening action accomplished by means of a sturdy 14 ga. sheet metal troughing pan. The conveyor is manufactured with a variety of belt widths.

Available in 20'-50' length frames in 5' increments, the Finco portable unit has a capacity of 50 tons/hr. at a belt speed of 150 ft./min. carrying a commodity with a density of 100 lbs./cu. ft.

Motive power is supplied by gasoline engine or electric motor.

In-take and discharge hoppers are optional and available in a variety of custom designs. Four-wheel dolly with towing hitch is also optional.

Shipping weight of the 50' portable conveyor, without hoppers or dolly, is 3700 pounds.

For full details, circle number 17 on CF's Information Service card, page 39.



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New Handi-Truck

A new handtruck has just been announced by Southeastern Manufacturing, Inc., and is claimed by the manufacturer to be the first significant development in handtrucks since the rubber tire.

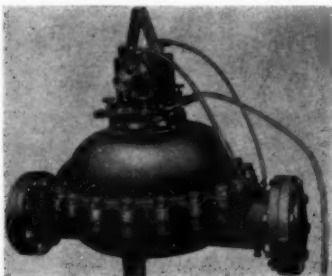
The new truck features 'roller conveyor action,' as shown on the photo inset, which allows the load to be much more easily loaded and unloaded than with conventional trucks. Closer stacking is possible with the new truck, as loads do not have to be shoved by hand after unloading.

The entire truck is sturdily built of electrically welded steel tubing and is fitted with high quality ball bearing rubber tires. Cost of the new Handi-Truck compares to ordinary handtrucks without the 'roller conveyor action.'

Full details, prices, and catalog sheet can be obtained by circling number 18 on CF's Information Service card, page 39.

Large-Capacity Dispenser For Liquid Fertilizer

New Measuremix automatic liquid fertilizer dispensers to fit 3-, 4- and 6-inch water pipe sizes are now available in addition to ¾- and 2-inch models. With all models, mixing of fertilizer and water in proportions is automatic and is not affected by changes in water flow or pressure. Use of power equipment is unnecessary as mixing action is accomplished by the flow of water in the pipeline.



Fertilizer solution is sucked from open containers and no pressure tanks are required. Maintenance is easy as one or two assemblies can be replaced quickly after long service. Stainless steel parts are used in the injection system.

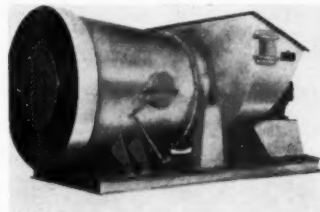
A new catalog describing the complete line of Measuremix units (water capacities from 15 to 700 gallons per minute) is available by circling number 19 on CF's Information Service card, page 39.

New Type Fan

To satisfy the demand for a large fan with great regulation economy and high efficiency, American SF Products, Inc., has announced introduction of a completely new type of fan.

The main feature of the new SF Axial Flow Fan is that it is provided with impeller blades than can be adjusted during operation. Adjusting the blades allows the air flow to be regulated while the fan is kept running at a constant speed. By this means, variations of the air or gas flow can be effected rapidly, and with excellent regulation economy and peak efficiency over the whole regulation range.

The new fan has a higher speed than centrifugal fans. Thus, large



axial fans can be used for motor speeds of 725, 980 or 1450 rpm. No expensive gearing between motor and fan is required, a feature that decreases the initial cost of the fan installation. The impeller blades are easily replaced without dismantling of the whole fan, providing less costly maintenance.

Forty-eight standard sizes are available, for flows ranging from 30,000-600,000 cfm and a range up to 24" w.g.

For full information, circle number 20 on CF's Information Service card, page 39.

Applicator-Nurse-Transport

Newton Crouch, a firm specializing in fertilizer application equipment, is offering a new high capacity truck applicator for liquid fertilizers, which serves also as a nurse unit or transport. Designed for heavy duty service, the unit is equipped with positive displacement



metering pump driven by split-shaft power take off, also with a centrifugal pump for transferring solution.

Supplied with a 1000-gallon aluminum or coated steel tank, the equipment is furnished with 27½-foot shock-absorbered aluminum or stainless steel pipe booms which swing upward and forward against tank sides for travel. Spray tips and nozzles can be furnished for any application method. A roller pump provides agitation of solutions containing herbicides.

For additional information on this versatile unit, circle number 21 on CF's Information Service card, page 39.

Stand-Up Tractor Shovel

A new 'Michigan' Model 12B Tractor Shovel featuring rear-mounted, stand-up type control is now on the market.

Announcement of the new machine is made by the Construction Machinery Division of Clark Equipment Company.

Especially valuable to the industrial user is the stand-up operation of the Model 12B. This feature enables the man using the machine to mount and dismount quickly enough to be a significant time and fatigue saving factor. Overall labor saving also is notable in operations where tractor shovel use is normally intermittent.

Powered by a Waukesha Model 180-DLC, 42 hp diesel engine, the



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Model 12B has a Clark power train. Drive line features include the Clark 3 to 1 multiplication factor, industrial type torque converter, power shift transmission, and spiral bevel gear and pinion drive axle with planetary reduction in the wheels.

Maximum forward speeds are 5.6 mph in first gear and 11.2 mph in second. Top reverse speed is 10.5 mph.

Another of the new Model 12B's features is the machine's adaptability to a wide variety of buckets. Excluding special buckets, these range from 13 cu. ft. to 1 cu. yd. in capacity, and from 42 to 62 in. wide. Accessory equipment includes mounting plate for stoking ram, and forks. Also available are special buckets, fork lifts, bucket teeth, and flame and spark arresting equipment.

Lifting capacity is 3520 lbs. (This capacity is 85 per cent of tipping load measured from center of gravity of standard excavating bucket at maximum reach with rear controls.)

The new Model 12B Tractor Shovel also features a short turn radius for maximum maneuverability in close quarters. Total machine weight of 6470 lbs. is distributed with 2970 lbs. on the front axle, and 3500 lbs. on the rear axle.

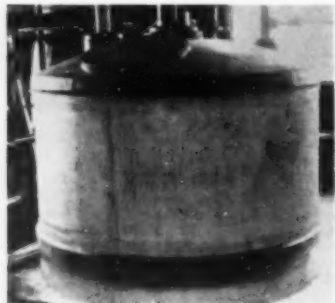
Bucket action and control is hydraulic. The two boom cylinders have 3½-in. diameter chromium plated piston rods and chevron ring packing.

The hydraulic pump is a 12-gallon per minute (at governed engine speed) unit driven from the timing gears. The valve is a two spool type with built-in adjustable relief valve. An easily accessible reservoir with baffles and hand hole for cleaning also is featured.

For additional information circle number 22 on CF's Information Service card, page 39.

Plastic Processing Vessels

A new line of J & H Fiberglass Plastic Processing Vessels provides corrosion resistance and self-supporting structural strength at low cost. Ten standardized diameters are available with various capacities for 50 to 70,000 gallons. Fabrication is on high precision molds, that produce a glass-smooth inner surface. Basic tank is translucent with a molded-in direct reading gauge. Liquid level is always visible during batching and processing operations. Vessels are much lighter than



stainless steel and are easily installed. The model shown extends between floors for processing reasons. The perforated sparge pipe for aerating is of standard J & H Fiberglass Plastic. All tubing, fixtures, such as agitator and plate coils are corrosion resistant.

For more information circle number 23 on CF's Information Service card, page 39.

Dryers, Coolers, Heaters

A new 24-page catalog from Hardinge Company details their line of Ruggles-Coles dryers, coolers and heaters. A new slant on moisture removal, Bulletin 16-E provides new and valuable information for your equipment library.

For a free copy, circle number 24 on CF's Information Service card, page 39.

Corrosion-Resistant Rotameter

Schutte and Koerting Company, Instrument Division, is offering Bulletin 18-RG describing their 'Safeguard' Rotameters, recommended for trouble-free performance in corrosive environments. Designed for continuous, accurate and easy-to-read indication of flow rates, the devices are available in a wide range of sizes and choice of corrosion-resistant end fittings and floats from stock.

For a copy of Bulletin 18-RG, circle number 25 on CF's Information Service card, page 39.

Material Weighing on Conveyor

The new, simplified Pneumatic Integrator Model PDWH-T is the ideal solution to the problem of weighing material being transported on a conveyor belt, according to the new bulletin recently issued by B-I-F Industries, Inc., manufacturers of equipment and systems for positive control of materials in motion. The PDWH-T Integrator multiplies belt travel with belt loading to produce direct read-out of the true weight being conveyed over the weighing section.

Long life and minimum maintenance are assured in compact design of the PDWH-T Integrator, accenting such features as explosion-proof construction, high sensitivity, direct-reading totalization, and simple adjustments for zero settings.

The new, revised bulletin includes an illustration of the PDWH-T Integrator, together with dimensional drawings, accessory listing and other descriptive material.

For a free copy of bulletin No. 550.20-2, circle number 26 on CF's Information Service card, page 39.

Nuclear Gauging System

A new four page folder describes details, method of operation, and specifications for nuclear gauging systems to be applied in the measurement of liquid, solid, or slurry levels or interfaces.

Schematic diagrams show six types of applications while photographs illustrate component equipment.

Other sections cover radioactive

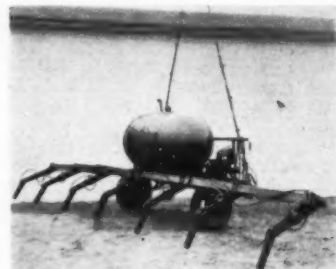
sources and source holders, detectors, zero suppression, amplifier/indicator, motor driven gauge, and gamma switch.

For free copies of the new folder, Bulletin No. 196, circle number 27 on CF's Information Service card, page 39.

New Liquid Applicator

For custom operators and farmers with large acreages to cover in a relatively short applying season, Pollard Manufacturing Company announces the addition to its line of applying equipment of a new model, a Seven-Row 'Custom Brute' applicator for use with both liquid nitrogen solutions and mixed liquid fertilizer.

This new Seven-Row Model, with the same rugged characteristics as Pollard's widely used Five-Row and Three-Row machines, has a tool bar that is 20 feet long overall—another feature designed by Pollard to



enable the operator to cover more acres per day—and more days per week.

The new Seven-Row 'Brute' is available with choice of coil spring shanks or rigid shanks, and choice of piston metering pump, squeeze type pump, centrifugal pump, or PTO-driven air compressor. Also offered are aluminum pressure tanks, fiberglass tanks, or heavy gauge steel tanks, all carefully designed to suit the various fertilizer formulas.

Pictured is Pollard's -Row Custom Brute in an all-purpose combination applicator and sprayer for mixed liquid or liquid nitrogen solutions, equipped with fiberglass tank, metering pump, front-mounted protective-coated steel boom with stainless steel and nylon eyelet nozzles.

For further information, circle number 28 on CF's Information Service card, page 39.

Fertilizer Industry Round Table Proceedings

Complete proceedings of the Fertilizer Industry Round Table technical conference, held last November, are now available.

Price: \$4 per copy. Order from:

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How Union-Camp's 5-Star Plan saved multiwall user up to \$450 per carload of bags

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A major mid-west packer* wasn't convinced his multiwall bagging operation was all it might be. Could Union-Camp's 5-Star Multiwall Plan help?

To get the answer, Union-Camp multiwall specialists visited the plant. They found that the automatically filled bags occasionally stuck in the sewing head. Also, that the sewing line tended to "belly" and form an arc pattern. The result was considerable loss in production and frequent breakage. Another problem—the bags didn't warehouse well.

"Sew-Straight" Solution

After completing their analysis, the Union-Camp men suggested installing a "Sew-Straight" attachment right onto the sewing head. The bags could now be closed with an "E" head in a perfectly straight line. And only 1 inch from the top of the bag. That single inch made all the difference.

Less paper—less breakage

To begin with, shorter bags could be used. The savings in paper alone cut

the firm's multiwall costs from between \$350 to \$450 a carload. Imagine the savings based on several dozen carloads a year!



Before and After. Old, semi-circular closure pattern (left) and the new closure (arrow). Note the straight sewing line, and how close it is to the top of the bag.

The new attachment also speeded production by eliminating sewing head jam-ups. Moreover, since the top closure is now identical to the factory-sewn bottom closure, the bags form a perfect pillow shape—no awkward ears. This makes them easier to handle . . . easier to stack. And there's less breakage and fewer rejects.

How much could you save?

Perhaps an idea unearthed through Union-Camp's 5-Star Plan could save you money. The chances are excellent. For every day, multiwall users, large and small, are reducing their multiwall costs by capitalizing on this comprehensive packaging service. Their savings run from a few thousand dollars to over \$100,000 a year.

Apart from bag construction, this economy program covers bag design, specifications control, packaging machinery, and a survey of your materials handling operation. And it costs you nothing—regardless of the brand of bags you now use.

FREE 16-PAGE BOOKLET

Write Dept. M-3 today for a free copy of Union-Camp's new 5-Star Plan booklet. It describes many case histories showing how packers like yourself have achieved greater efficiency and economy in their multiwall operation.



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* NAME ON REQUEST

April, 1961

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INDUSTRY PEOPLE

Southwest Potash

Kenneth D. Jacob, specialist in fertilizer technology, has joined Southwest Potash Corporation as a consultant. Thomas W. Childs, president, announced last month. Southwest Potash is a division of American Metal Climax, Inc.



Jacob

Dr. Jacob retired earlier this year as special assistant to the director of the Soil and Water Conservation Research Division of the Department of Agriculture. He became engaged in fertilizer research work in 1919, when he entered federal employment, and since that time has served continuously in this field. He is the author of numerous articles dealing with the chemistry and technology of fertilizers and fertilizer materials.

Dr. Jacob is past-president of the Association of Official Agricultural Chemists. In 1958, he received the Harvey W. Wiley Award of the AOAC. He also received the Superior Service Award, U. S. Department of Agriculture in 1947 for his research on phosphate fertilizers.

Commercial Solvents

G. Hilmer Lundbeck has been elected to the board of directors of Commercial Solvents Corporation, it was announced by Maynard C. Wheeler, president.

Raymond Bag

Raymond Bag Corporation has announced that Jerry Agin has joined their sales organization and will be working out of the company's Louisville office, covering southern Ohio, Indiana, and eastern Kentucky.



Agin

Prior to joining Raymond Bag, Mr. Agin was connected with the Formica Corporation and the Burgeson Metals Company in Minneapolis.

Sohio

Sohio Chemical Company has announced that Russell I. Pisle has assumed his new duties as staff assistant to James W. Bibbins, agricultural sales manager.



Pisle

Mr. Pisle joined Sohio in March, 1955, as an agricultural salesman. He is a graduate of Iowa State College where he majored in agronomy.

Mr. Bibbins announced that Mr. Pisle has been replaced in the Ohio sales territory by T. P. Mericle, who was formerly assigned as agricultural salesman in the southern territory.

Bemis

A. N. Weeks, vice-president and director of production of Bemis Bro.



Weeks



Proctor

Bag Company and a member of the firm's board of directors, retired February 28. He had been with Bemis since 1919 and long has been one of the nation's foremost authorities on packaging and packaging machinery.

Mr. Weeks will be succeeded by E. M. Proctor, who has been with the company since 1926, as director of production for the company since last September.

M. E. Ocker, manager of the Wichita plant and sales division of Bemis Bro. Bag Company since 1928, retired from the company February 28. He had been with Bemis for more than 50 years. He will be succeeded at Wichita by George W. Finlay, who joined Bemis in 1946, and has been supervisor for multi-wall bag sales in St. Louis since 1957.

Texas Gulf

Arthur Gloster has joined Texas Gulf Sulphur Company as assistant manager of research.

Mr. Gloster has been chief engineer of Titlestad Corporation for the past five years and has specialized in the design of sulphuric acid plants. From 1935 to 1955 he was with Chemical Construction Corporation, in design and construction of chemical plants, becoming assistant chief engineer.

Chase Bag

A realignment of top executives is announced by Chase Bag Co.



Elliot K. Ludington, Jr.



Francis H. Ludington, Jr.

Francis H. Ludington was elected chairman of the board and chief executive officer. He had been president since 1934.



Ayers

Succeeding him as president is Elliot K. Ludington, Jr., who formerly was executive vice-president.

The new executive vice-president is Francis H. Ludington, Jr., formerly vice-president and treasurer, and, before that, vice-president in charge of production.

William N. Brock, who had been vice-president and director of sales, assumed the post of vice-president and assistant to the president.

Richard H. Ayers was named vice-president and director of sales, succeeding Mr. Brock. He recently had been vice-president, Paper Bag Division.

Elected vice-president in charge of manufacturing is John A. Book, former vice-president in charge of labor relations.

William Hirst, Jr., formerly controller, was made treasurer. He was succeeded by Joseph H. Kuhr, Jr.



Another big load coming your way?

Only *Burlap* can handle it for you. You save on space, because burlap bags stack higher. You save on waste...burlap keeps breakage down. You save on handling costs...only burlap can take on 200-pound loads. You save on the bags themselves...burlap is re-usable. And another big plus...the farmer likes burlap. *He* asks for it. You should too.

THE BURLAP COUNCIL • 122 East 42nd Street, New York 17

Campbell Fertilizer

J. A. Tennant, Jr., has been named president of the Campbell Fertilizer Co., Houston, Texas. Mr. Tennant, who also is president of Jenneta Nurseries, succeeds G. H. Seibel, temporary president, who now is vice-president in charge of manufacturing.

Richardson Scale

Walter M. Young has been elected a vice president of Richardson Scale Company. He continues to direct the marketing activities of the company.



Young

Mr. Young has been with Richardson since 1948, when he joined the company's engineering department. Since that time he has held positions in the process control department, mechanical development section, service department, and electrical development department.

Allied Chemical

Two key agricultural research appointments have been made by Allied Chemical's General Chemical Division, according to an announcement by John C. Fedoruk, technical director.

Merrill M. Darley, technical supervisor for the past 13 years, has been named manager of agricultural research. Leonard H. Dhein succeeds Mr. Darley as technical supervisor of agricultural research.

Ortho

Frank Juchter, vice-president and manager of manufacturing for the Ortho division of California Chemical Company, Richmond, California, recently announced the appointment of Robert J. King as administrative assistant to the manager-manufacturing. Mr. King comes to Ortho with over 15 years of service in various Standard Oil Companies.

The retirement of Phil S. Williams as vice president, director and chief engineer of Ortho division has been announced by Howard J. Grady, president.

Mr. Williams plans to continue business activity as a consulting chemical engineer and as an officer and director in Johnson-Williams, Inc., an electronics instrument company in Palo Alto, California, which he founded.

He will remain at California Chemical Company headquarters in

San Francisco in the capacity of consultant until the Ortho plant food plant now under construction at Fort Madison, Iowa, project that has been under his supervision since its inception, is put into operation late this year.

David L. Barton has been named chief engineer, succeeding Mr. Williams. Mr. Barton was assistant chief engineer since 1954. He joined the company in 1939.

US Borax

Ronald W. Davis has been appointed agricultural chemical sales representative for United States Bo-

rax & Chemical Corporation at Youngstown, Ohio.

W. P. Brashear, sales representative, has been transferred from Sulphur Springs, Texas, to Madison, Wis. He will represent the company in Iowa, Wisconsin, Minnesota, North Dakota and South Dakota.

M. I. Signer, Jr., has joined the company in Carlsbad, N. M., as a senior mine engineer. Mr. Signer, former western phosphate project manager for International Minerals & Chemical Corp., also spent several years as Canadian project manager for International.

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- Accurate spreading through properly engineered hoods, as low as 75 pounds an acre.
- Flat wire conveyor belt of stainless steel produces uniform flow of material with positive traction.



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Association Activities



Top: Program participants at the recent Colorado Soil Fertility Training Sessions were (left to right): Bill Stewart, Colorado extension agronomist; Marlowe Wood, Wilson & Geo. Meyer & Co.; R. B. Bahme, Western regional director of National Plant Food Institute; Ed McMillan of Spencer Chemical Co., president of Rocky Mountain Plant Food Association; M. J. "Bud" Hartman, Phillips Chemical Co.; and Program Moderator Bill Wonders, Colorado Agricultural extension service.

Bottom: Taking part in the sessions were Marlowe Wood (left), Wilson & Geo. Meyer & Co., and Keith Campbell, Western Phosphates, Inc.

CFA Awards 6 Scholarships

The Soil Improvement Committee of the California Fertilizer Association announces the award of six scholarships to deserving California State College students of soil science, crop production, chemistry, animal husbandry, and related subjects.

These scholarships, each in the amount of \$100.00, have given to students who were chosen by the faculty scholarship committees at the San Luis Obispo and Pomona Campuses of California State Polytechnic College, Fresno State College, and Chico State College.

Lawn and Garden Show in October

The Eastern Lawn, Garden and Allied Products Trade Show will be held at the Coliseum, New York, October 20-22, according to Frank M. Yeager, managing director.

Floor plans and complete exhibitor information may be obtained by writing Eastern Lawn, Garden and Allied Products Trade Show, Suite 1103, 331 Madison Avenue, New York 17, New York.

COMING

Indiana: The third "minimum tillage" field day will be held May 17 (in case of rain, May 24) in Cass County. C. L. Hill, Extension Agricultural Engineer, Indiana AES, Lafayette has the details for you.

HELD

Arizona: February 8 and 9 more than 175 growers, fertilizer salesmen and college specialists attended. The over all theme was "Plants and Fertilizers at Work."

Colorado: January 25 through February 16 brought some 50 to attend each of four two-hour sessions at the Soil Fertility Training program. The consistent attendance encouraged the planning of additional schools next year for other sections of the state.

Colorado: The effect of soil moisture, nutrient availability and crop growth was a subject of keen interest at the Sprinkler Irrigation Conference held in Denver during March 5-7. More than 100 attended.

Nebraska held its 11th annual Fertilizer Dealers Training Conference at Lincoln, with top-flight speakers stressing the need for more plant food use.

Colorado Growers To Be Honored

Ten efficient Colorado corn and sugar beet growers will be recognized for their record achievements at a luncheon in their honor in Denver, April 14.

This Colorado Production Achievement Award Program is being co-sponsored by the Western Regional office of National Plant Food Institute and Colorado State University. The luncheon will be held at the Denver Chamber of Commerce.



Arizona Fertilizer Conference: Five speakers featured at the 4th Annual Arizona Fertilizer Conference. E. O. Foster, Balfour, Guthrie & Co., Ltd. and chairman, Soil Improvement Committee of Arizona Agricultural Chemicals Assn.; L. R. Hamilton, California Chemical Co., Richmond; Dr. Wallace Fuller, head, Department of Agricultural Chemistry and Soils, University of Arizona; Dr. Richard B. Bahme, Western Director, National Plant Food Institute, San Francisco; and Dr. C. O. Stanberry, U.S.D.A. soil scientist, Tucson.

New Group Formed to Fight Air Pollution

Another step was taken March 4 in the national problem of air pollution control at a meeting of the Industrial Gas Cleaning Institute, Inc., with headquarters at 23 West 45th Street, New York City.

The organization is composed of the manufacturers of equipment designed to remove solid and liquid pollutants from the discharge of furnaces, kilns, chemical processes and other creations of the industrial age. These gas cleaners include electrostatic precipitators, mechanical collectors, fabric filters and net scrubbers.

The purposes of the organization are to conduct studies and to do research on methods for improving air pollution control.

Southern Control Officials

The Association of Southern Feed, Fertilizer and Pesticide Control officials have announced that their convention, to be held in Lexington, Ky. June 5-7, will headquarter at the Lafayette Hotel.

Industry Meeting Calendar

DATE	EVENT	LOCATION	CITY
June 5-7	Southern Fertilizer Control Officials	Lafayette Hotel	Lexington, Ky.
June 11-14	National Plant Food Institute	The Greenbrier	Wh. Sul. Spgs., W. Va.
June 27-29	Pacific N.W. Fertilizer Conference	Marion Hotel	Salem, Ore.
July 19-21	Southwest Fertilizer Conference	Galvez Hotel	Galveston, Tex.
Aug. 16-20	Canadian Fertilizer Association	Manoir Richelieu	Murray Bay, Que.
Oct. 4-6	Southeastern Fertilizer Conference	Biltmore Hotel	Atlanta, Ga.
Oct. 12-13	Northeastern Fertilizer Conference	Schine Inn	Chicopee, Mass.
Oct. 25-26	Fertilizer Control Officials	Woodner Hotel	Washington, D. C.
Oct. 30-Nov. 1	National Fertilizer Solutions Assn.	Edgewater Beach Hotel	Chicago, Ill.
Oct. 30-Nov. 1	Official Agricultural Chemists	Shoreham Hotel	Washington, D. C.
Nov. 2-3	Pacific N.W. Fertilizer Assn.	Gearhart Hotel	Gearhart, Ore.
Nov. 8-10	Fertilizer Industry 'Round Table'	Mayflower Hotel	Washington, D. C.
Nov. 12-14	California Fertilizer Association	Jack Tar Hotel	San Francisco

SAFETY...



G. T. Newnam (third from left), Smith-Douglass Company safety director, presents the Presidential Trophy to L. M. Hanbury (second from left), general superintendent of the Norfolk plant, as W. F. Combs (left), safety supervisor, and R. E. Hargrove (right), fertilizer department superintendent, look on.

Norfolk Plant Wins S-D Presidential Trophy

The Norfolk plant of the Smith-Douglass Company recently received

300 Recognize Need for Safety Programs

Indications of optimism set the pace when the executive committee, Fertilizer Section, National Safety Council held its winter meeting in St. Petersburg, Florida. In the midst of cost reduction programs, the Section, through a very active membership committee, chaired by C. S. Griffith of Virginia-Carolina Chemical Company, reported an increase in its membership over the past year. Today, about 300 fertilizer plant operations are taking advantage of the services offered by the National Safety Council, putting the industry in continuous touch with technical advisers of safety.

Chairman of the Fertilizer Section, executive committee, A. I. Raney, Phillips Chemical Company, mentioned the projects which are presently being worked on by the Section. The foremost activity in the last three years has been the use of regional supervisory safety training schools, which over 500 supervisors have attended. The committee unanimously endorsed continuance of these schools, and is again requesting sponsorship through the National Plant Food Institute and the continued over-all direction of the schools by W. C. Creel, North Carolina Department of Labor, to whom much of the success of the past schools may be attributed.

A Safety Guide Book for the fertilizer industry has been taken on as a project by the committee and

ed the Presidential Trophy for its outstanding safety record. The trophy is awarded annually to one of the 15 Smith-Douglass plants on the basis of their safety records. The trophy was awarded the Norfolk plant in competition consisting of man hours worked, and number of safety meetings, plant inspections, and fire drills held in 1960.

The Norfolk plant safety program was initiated by L. M. Hanbury, plant superintendent. Under this program supervisors meet each day with their employees to instruct them in company policy and safe working procedures. The plant worked 562,538 hours in 1960 with only 952 hours lost due to injuries, and only 11 medical cases. W. F. Combs, plant personnel and safety supervisor, attributed the safety record to the efforts of the employees who have adhered to the training received under this program.

placed in the hands of J. F. Smith, Spencer Chemical Company, for its completion, expected by June 1961.

The vice-chairman of the executive committee, G. T. Newnam, Smith-Douglass Company, reported that he is working to assemble a very attractive agenda for the Section during the National Safety Congress which is held in Chicago in October 1961.

O-M Honors Former 4-H-ers

For 9 years Olin Mathieson have been honoring 4-H "alumni." This year 8 will be on the list, which includes a senator, the assistant dean of Iowa State, the home editor of Progressive Farmer magazine—and their like.

Industry Backs 4-H Foundation

53 fertilizer concerns in 24 states, Puerto Rico and the District of Columbia have contributed to the "Service to Youth" programs of the National 4-H Club Foundation during 1960. Let's make it unanimous; these kids are the farmers of the future.

Dean R. Gidney, vice president of Potash Company of America, took the leadership in developing the 1960 fund-raising project. The fertilizer industry is one of six agribusiness drives conducted for the Foundation by the National 4-H Sponsors' Council, a group of business leaders interested in young people.



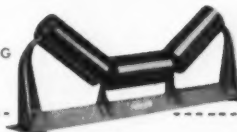
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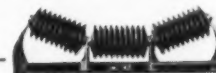
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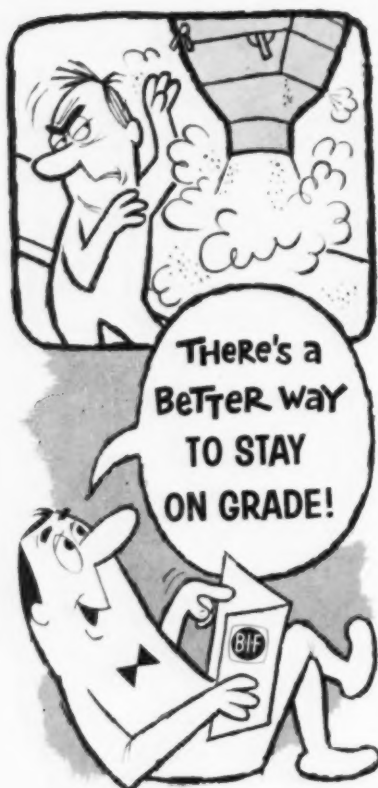
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-of This and That . . .

—Dr. and Mrs. K. D. Jacob left April 3 for a trip to Australia. Jake described it as a pleasure trip but may see some fertilizer folks. Catherine and Jake expect to be back in August.

—Dr. Richard B. Bahme, Western regional director of NPFI was recently elected to the council of the American Society of Range Management for 1961. He will be concerned with formulating plans for meetings and programs during the year.

—An industry-wide program by phosphate companies in Florida has been announced. Arthur Crago of American Cyanamid, chairman of the land use and reclamation committee of the Florida Phosphate Council, described it as the first joint effort by the eight companies to tackle problems of land reclamation. Increasing population and rising land values in the Polk-Hillsborough mining areas has heightened concern in the area. The eight companies are: American Agricultural Chemical Co., American Cyanamid Co., Armour Agricultural Chemical Co., Davison Chemical Div. of W. R. Grace and Co., International Minerals and Chemical Corp., Smith-Douglass Co., Swift and Co., and Virginia Carolina Chemical Corp.

—Walter C. Saeman, senior research associate of the Metallurgical Laboratories of Olin-Mathieson discussed "Crystallizer Design Fundamentals" at the March ACS meeting in St. Louis. Crystallization is a production process widely used to attain purity of particle size specifications for such large volume commodities as alumina, sugar, salt, borax and fertilizer salts. Mr. Saeman's paper covered improvements in technology that he believes could introduce significant cost reductions or alterations in the chemical industry. Active in development of these processes for 16 years, his work was the basis for the design and installation of the 500-tons-a-day ammonium nitrate crystallizers in the TVA works at Muscle Shoals, Ala.

—Sen. George Parkhouse of Dallas, Texas, recently threw his weight behind a bill to regulate safety brakes on farm trailers. Said the Senator: "I don't want to get hit by any fertilizer" . . . Particular, ain't he?

Broadened Eligibility for Farm Operating Loans

Secretary of Agriculture Orville L. Freeman announced March 14 that the Farmers Home Administration has revised its eligibility requirements for operating loans so as to better serve the credit needs of small farmers.

Farmers who can profitably use operating loans to increase their farm income and have the ability to repay their debts are now eligible even though they cannot presently obtain all the resources needed for family-type farm operations, and lack opportunity at this time to adequately supplement their farm income with off-farm employment.

Previously operating loans were made only to farmers who could obtain the resources needed for family-type farm operations, or who could supplement their farm income with off-farm employment to the extent that their total income was equal to that from a family-type farm.

Included in the group of small farmers not previously eligible are (1) young farmers who in the near future will be able to obtain additional land and other resources, (2) young and middle-aged farmers who

may be able to obtain off-farm income in the near future, and (3) some farmers who are nearing retirement.

Operating loans are made for the purchase of livestock and equipment, for fertilizer, tractor fuel, feed and other essential farm and home operating needs, and to refinance chattel debts. The loans are scheduled for repayment in accordance with the borrowers' abilities to repay, over periods not exceeding seven years. The interest rate is 5 percent.

Other eligibility requirements remain unchanged. Applicants to be eligible must be unable to obtain adequate credit from other sources, and with the aid of the loan be able to earn an income sufficient to pay necessary farm operating and family living expenses and meet the required payments on their debts.

Fertilizer Wall

At the annual meeting of Consumers Cooperative, a prize was offered for the best estimate of how long a wall would be built if all the fertilizer in dry form sold by CCA in 1960 were laid up as a wall five feet high and five bags thick. The answer was 372 miles.

New Manual Covers Paper Shipping Sacks

The Paper Shipping Sack Manufacturers' Association has announced that their General Manual No. 4 is now off the press and available for distribution.

The 28-section, 44-page manual covers recommended practice for handling, storage and shipment of material packed in paper shipping sacks.

Copies of the new manual—designed for use by industries that pack, ship or handle multiwall or other paper shipping sacks—are available for immediate shipment in any reasonable quantity at 50 cents per copy, plus postage.

To order copies, write to C. G. Peterman, Assistant Executive Secretary, Paper Shipping Sack Manufacturers' Assn., 370 Lexington Ave., New York 17, N. Y.

Burlap Outlook Shows Promise

Burlap prices leveled off in mid-March for the third week in a row when buyers and sellers continued to limit buying as they pondered the probable effect of the voluntary scheme in India to stop the price rise which recently swept the market to a nine-year peak. The evident determination of the government, in cooperation with the trade, not only to hold present prices but to get them down to a competitive level, and a quieting effect.

In an address before the Indian Jute Mills Association, chairman, D. C. B. Pilkington declared that there are reasonable grounds for expecting a good jute crop this year. If this expectation is fulfilled, the industry will have turned the corner in its present difficulties before the end of the year. This news is of keen interest to America's converters of burlap and consumers of bags and jute fabrics, as India supplies about 86% of the 850 million yards of burlap which the U.S. consumes each year, and this is India's largest burlap market.

The chairman's comment on the outlook followed a detailed review which he gave of the progressive difficulties which the jute industry has faced since the beginning of last year when the prospect of a sub-normal carry over of raw jute from the 1959 crop was followed by a sizeable deficit in the 1960 crop yield as a consequence of a prolonged drought in the spring of last year. This produced a very tight raw material position which still

confronts the mills as they must work on a carry over from last year's crop until the new crop is available in August of this year.

Phosphate Concerns Reclaim More Land

The Florida Phosphate Council, recognizing the need for land, and the desirability of reclaiming as a public relations move, have voted as a group to step up their operations in this field. A number of the companies have been doing this for some years. The industry-wide application of land reclamation is the new thing.

Hercules Develops Nitric Concentration Process

Hercules Powder Co. has developed a process to produce 60% nitric acid, which is then concentrated to 99.99% by extractive distillation, with a solution of magnesium nitrate.

Fertilizer Knowledge

(continued from page 24)

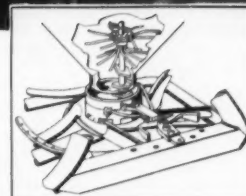
Seventeen percent of this group mentioned basic fertilizer information and an additional 51 percent mentioned soil testing and inter-

pretation as the "information type" of services being important enough to them that they would change dealers to get them.

It appears that the fertilizer industry has long been plagued by selling a product mainly on the basis of cost (price). An alternative to this approach is to help the farmer program the use of fertilizer in terms of the benefits to the farmer. An example of this thought process may be worthy of repeating. The usual price discounting rate may "save" the farmer from 50 to 75 cents an acre. Proper fertilizer programming can make (benefit) the farmer realistically from \$10.00 to \$20.00 per acre. To move from price as a selling technique to merchandising fertilizer on the basis of returns to the farmer (benefits) will entail many changes on the part of those in the fertilizer industry and their marketing structure. One of the important ingredients that must go into this change is increased knowledge about fertilizer, its application and the economics of its use. It appears that there will have to be a concerted effort to raise the knowledge level of manufacturer and distributor salesmen or technicians, the dealers and farmers.

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Simple in design yet robust in construction, the LELY Distributor's exclusive design features assure accurate and uniform spreading of all types of material—fertilizer, lime, seeds, pelletized 24D etc. Spreading range is fully adjustable, from 5 lbs. to 1500 lbs. per acre, with an effective spreading width up to 50 ft. (Does 25 acres an hour). Now available in 3 models—3-point hitch P.T.O. driven (illustrated), Tow type ground driven and Tow type P.T.O. driven. Hopper capacity 1000 lbs.



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CHANGES

Summers Fertilizer Buys Aroostook Hi-Test

Announcement from the home office of the Summers Fertilizer Company in Baltimore, Maryland advises of the acquisition of the manufacturing facilities, inventory and trade name of the Aroostook Hi-Test Fertilizer Company, Presque Isle, Maine. This old established company was a pioneer in the formulation of double and triple strength mixed fertilizers used on the potato fields of Aroostook County. Its origin goes back to the Higgins Fertilizer Company established in 1927 when concentrated mixtures were first introduced to Maine farmers. Subsequently, a local group of growers purchased Higgins. The new interests reorganized the company as a farmers' co-operative under the name of Aroostook Hi-Test Fertilizer Company.

The facilities of the Presque Isle plant and office will be operated as the 'Hi-Test Division' of the Summers Fertilizer Company, Presque Isle, Maine. The management will remain the same with W. R. Edgecomb, general manager; Harry Trask, sales manager; and G. Noel Currie, plant superintendent.

Summers also has plants at Houlton and Mars Hill, Maine from which it services its Southern and Central Aroostook County business. The Hi-Test plant will now serve the heavier-consuming North Central area of the Country's largest potato growers.

Fisons Acquires 3% of Spencer

Fisons Limited of Felixstowe, England, fertilizer manufacturer and distributor, has acquired 90,000 shares of common stock of Spencer Chemical Company, Kansas City. These are a slightly more than 3 per cent of all Spencer shares.

The stock transaction included 75,000 shares held by the estate of the late Kenneth A. Spencer, former head of Spencer Chemical, and 15,000 from other sources.

Chemical Society To Move Offices

The American Chemical Society has leased space at 733 Third Avenue, corner of Forty-sixth Street, New York. The society, which has

a membership of 92,000, will move from 2 Park Avenue.

Davison Chemical Division Acquires Wichita Fertilizer

Purchase of the Wichita Fertilizer Company facilities at Wichita, Kansas, has been announced by W. N. Watmough, Jr., vice-president for mixed fertilizers of W. R. Grace & Co., Davison Chemical Division.

Davison, a major producer of agricultural chemicals in the United States and particularly in the Midwest, has been in business for many years in Kansas. Acquisition of the sales and production staff of the Wichita company will enable expanded sales and service operations in this area.

A wide variety of fertilizer grades will be offered at this new Davison facility including the high analysis grades produced for the Kansas area by the company's Joplin, Missouri plant.

Simplot Buys, Will Move Anaconda Phosphate Plant

The Anaconda Company's Anaconda, Mont., treble superphosphate plant has been acquired by the J. R. Simplot Co. of Pocatello, Idaho. Price of the transaction was not disclosed.

In previous dealings, Simplot had acquired Anaconda's Conda, Idaho, phosphate properties and had taken command of operations of the grinding and preparation facilities at Anaconda.

The Montana fertilizer plant will be moved by rail and truck to Pocatello, starting in June this year, according to J. R. Simplot, president of the Idaho company.

The new plant will give Simplot the assist it needs in production of ammonium phosphate, not now produced by the Idaho firm, which currently produces phosphoric acid and treble super phosphates.

Simplot production will be increased from 80 to 100 per cent because of the addition of the ammonium phosphate unit and other Anaconda Co. facilities, Mr. Simplot reported.

In 1959, Simplot doubled its capacity with a \$2 million expenditure, main portion of which was for construction of a new sulphuric acid plant.

Berkshire Chemicals Sold To Its President

Malcolm H. McAllister, president of Berkshire Chemicals, Inc., New York City, has acquired the company from the parent Vitro Corporation of America.

The purchase was effective March 1, 1961, according to a joint statement by Mr. McAllister and W. B. Hall, vice president of Vitro in charge of the chemical and metallurgical group.

Berkshire was organized in 1949 and has been a wholly owned subsidiary of Vitro since December 1956. Gross annual sales are approximately \$3,000,000.

Mr. McAllister, who has a background of 26 years in the field of agricultural and industrial chemicals, was one of the original founders of Berkshire. "The business will continue as it is presently constituted. We hope to enlarge the scope of our selling activities, and to add other items to the present line," he stated.

New Olin-Mathieson Trade Marks

A new national \$2,500,000 corporate advertising campaign featuring a new and simplified corporate identity system that will affect the external look of all its diversified operations has been announced by Olin Mathieson Chemical Corporation.

The new advertising campaign, according to Henry H. Hunter, director of communications for Olin,

ROYSTER RE-STYLES

A redesigned line of packages, featuring two-directional printing layout, was introduced recently by F. S. Royster. Created by Union Bag-Camp Paper Corporation, the new packages combine uniformity of design and layout. The result is a strong family relationship among the company's three fertilizer products. The new design features the stylized Royster name, printed in bright yellow and displayed against brilliant contrasting backgrounds of green, red and blue. This serves to immediately establish a strong recognition of both the brand name and the different products. The most unique feature of the redesign is the combination of vertical and horizontal printing. The use of the vertical design on the back of the bag leaves room for the company to imprint them with the necessary information about the various formulas and analyses. In order to achieve maximum advertising and display value, the horizontal design appears on the front side of the bag.



will begin in mid-April in national consumer and business magazines. It will feature 4-color spreads in these publications: Life, Saturday Evening Post, Newsweek, Time, U. S. News & World Report, Harper's, Atlantic, New Yorker and Scientific American.

The major element in the new nomenclature and graphics system will be a shorter, simpler signature for the corporation itself. While the company's legal name will remain the same — Olin Mathieson Chemical Corporation — this 12-syllable signature will be abandoned in favor of the simple, more memorable 2-syllable signature—Olin.

Lummus Expands Engineering Development

The Lummus Company has expanded its engineering development center at Newark, N. J. to pace the company's growth into new areas of scientific activity, President James F. Thornton announced. The company is a designer, engineer and constructor of chemical and processing plants throughout the world.

"The prime objective of this broadened development program is to better serve the growing diversification of manufacturing needs of our clients," Mr. Thornton said.

Mr. Thornton said the broadened development program will be carried out by a strengthened and re-organized team of veteran and newly-employed scientists of the center in close collaboration with the company's central engineering department. Director of the engineering development center is Dr. Souren Z. Avedikian, who joined Lummus a year ago after 25 years in consulting and staff research and development work. Its manager is Ward J. Bloomer, with Lummus 30 years.

Oregon State College Is Now 'University'

Oregon State University is the new name for Oregon State College at Corvallis, as the result of action taken by the Oregon legislature. The bill was signed into law by Governor Mark Hatfield and became effective on March 6.

Fertilizer Lien Bill Fails in Idaho

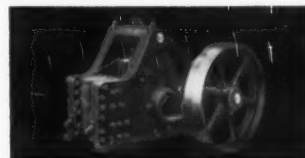
A bill to permit fertilizer to become a lien again crops, proposed in the Idaho Legislature failed of passage. The seed lien law still stands.

NO MAJOR REPAIRS IN 25 YEARS*

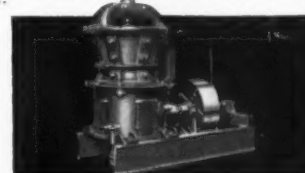
Sturtevant Construction Assures Long Mill Life at Top Loads

Sturtevant crushing and grinding machinery answers the long life top-load production problem for medium to small size plants. Many Sturtevants have been operating above rated capacities for more than 25 years, and without a major repair.

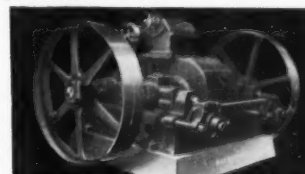
"Open-Door" design gives instant accessibility where needed — makes cleanouts, inspection and maintenance fast and easy. Machines may be set up in units to operate at equal quality and capacity.



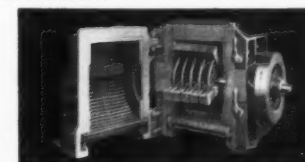
Jaw Crushers — Produce coarse (5 in. largest model) to fine (1/4 in. smallest model). Eight models range from 2 x 6 in. jaw opening (lab model) to 12 x 26 in. Capacities to 30 tph. All except two smallest sizes operate on double cam principle — crush double per energy unit. Request Bulletin No. 062.



Rotary Fine Crusher — Reduce soft to medium hard 3 to 8 in. material down to 1/4 to 1 1/4 in. sizes. Capacities up to 30 tph. Smallest model has 6 x 18 in. hopper opening; largest, 10 x 30 in. Non-clogging operation. Single handwheel regulates size. Request Bulletin No. 063.



Crushing Rolls — Reduce soft to hard 2 in. and smaller materials to from 12 to 20 mesh with minimum fines. Eight sizes, with rolls from 8 x 5 in. to 36 x 20 in.; rates to 87 tph. Three types — Balanced Rolls; Plain Balanced Rolls; Laboratory Rolls — all may be adjusted in operation. Request Bulletin No. 065.



Hammer Mills — Reduce to 20 mesh. Swing-Sledge Mills crush or shred medium hard material up to 70 tph. Hinged-Hammer Pulverizers crush or shred softer material at rates up to 30 tph. Four Swing-Sledge Mills with feed openings from 6 x 5 in. to 20 x 30 1/2 in. Four Hinged-Hammer Pulverizers with feed openings from 12 x 12 in. to 12 1/2 x 24 in. Request Bulletin No. 084.

*Reports Manager W. Carleton Merrill concerning Sturtevant Swing-Sledge Mill at James F. Morse Co., Boston.

STURTEVANT MILL COMPANY

153 Clayton St., Boston 22, Mass.

Research Briefs...

Insect weighing is, obviously, a tricky thing. New Zealand's Dr. D. Spiller, entomologist, works with insecticides, and it is important to know how soon the bugs die. He found out that a dead bug dehydrates faster than a live one, and uses this to set the exact time of death. This is simpler than it sounds because the good doctor uses one insect at a time. How much patience can a human have!

Seed-fertilize-mulch. A paper company has found a way to put seed on difficult places, where wind and water erosion defeat the aim. They simply mix cellulose fibers, fertilizer and seed in a spray. The fibers hold the seed in place, the fertilizer feeds 'em . . . and the seeds, naturally, grow into fine, thick grass.

Soil blocks made on a unique machine are proving practical as a way to grow vegetable plants. The pressed cubes are not really a new idea, having been used abroad for a long time. The seed is, of course, inserted in the soil block—and the resulting plant is readily transplanted, soil block and all. The machine can produce 2000 blocks an hour, and was developed by Abram Barg, Leamington, Ontario, Canada.

Atomic Energy has been tested in a

greenhouse, where two gladiola bulbs were planted under identical conditions—except one was exposed to radiation. One germinated in two days and within 3 weeks had grown to 2 feet. The other took days to germinate, and grew to only 3 inches in 3 weeks. One bloomed last month—the other will not make it until May. And now Oak Ridge Atom Industries has 27 varieties of atomic energized bulbs, seeds and such ready for the public. Dr. Clarence J. Speas is head man of the concern.

Growth stimulator: The USSR has a chemist who uses alkali to stimulate plant growth—using oil waste and caustic to make a substance with properties like hormones and vitamins.

One-shot fertilizer as a treatment for container-grown plants has been developed by a Dow Chemical team. It consists of synthetic ion exchangers that have nutrient reservoirs much larger than the natural soils, so the plant food can be mixed in the soil at the time of planting, and offer nutrients to the plant for the rest of its growth life.

Plant population is subject of a continuing study. 1960 tests showed yields of corn the same for 20 and 40 inch rows when population and

fertility treatments were the same.

Holly cuttings, experimented with over a three-year period, showed that the addition of boron in the form of boric acid to the standard indolebutric treatment increased the percentage of rooted cuttings, more and longer roots, and shorter rooting time. Data from C. J. Weiser, Oregon State.

The Morrow Plots — which have been demonstrating good soil management for 84 years now—are still at it. Some have been in continuous corn since 1888. Naturally yields went down and stayed down until 1955, when some plots were treated regularly with lime and mineral fertilizers. Result: 75 bushels per acre over the untreated plots. And the dry year of 1959 showed the treated plots doing mighty well by contrast with the rest. The University of Illinois can tell you more . . . lots more!

Obituaries

Louis E. Childers, 60, an information chief of the USDA, and with the department since 1937, died February 28 in Washington.

Francis White, 68, former diplomat, since his retirement an executive of Baugh Companies, Baltimore agricultural chemicals manufacturer, died February 23 of a heart ailment, at his home.

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The International Scene

INTERNATIONAL 12 million tons—world N figure

World production of fixed nitrogen during the fertilizer year ended June 30, 1960, totaled 12,329,000 metric tons (one metric ton equals 0.9842 long tons), an increase of 9.3 per cent over the 11,284,000 total in the preceding 12 months, according to a report by the British Sulphate of Ammonia Federation, Ltd.

World consumption of all forms of fixed nitrogen in the 1960 year, the federation estimated, totaled 12,348,000 metric tons against 11,147,000 metric tons the year before, or an increase of 10.8 per cent. The 1960 year total included 10,283,000 metric tons used in agriculture against 9,364,000 tons this year before, it was estimated.

F.A.O.

Moves toward world soil map

Approval has been given to the fifth and final draft of a 1:2,500,000—scale soil map of Europe and accompanying text on the soil associations of Europe by the Food and Agriculture Organization's working party on soil classification and survey. The working party is a subgroup of the FAO European Commission on Agriculture.

Following final approval by the ECA working party in Athens this spring, the map will be published in atlas form.

Work was also begun, under Prof. R. Tavernier, Belgian soil scientist who is chairman of the working party, on a more detailed 1:1,000,000—scale version which is expected to be published in two years' time.

"The finished map was a pioneering attempt to reach agreement between the European member countries of FAO on terminology and a unified soil classification system," said Dr. D. L. Bramao, FAO senior soil scientist. "The larger-scale map will lead directly to improved agricultural development in these areas by the more certain application of fertilizers and farming methods to the right kind of soil conditions." The same working party is also working on a 1:5,000,000-scale map of Europe.

INDIA

Invites foreign firms

Well-known foreign firms will be allowed to have minority participation in the equity capital of four

fertilizer plants that are to be set up in the private sector.

These plants will be set up in Andhra Pradesh, Madhya Pradesh, and Rajasthan.

A number of Indian entrepreneurs have applied to the Central Government for setting up these plants. They propose to collaborate with some American, Italian and West German firms. The Government will decide which Indian party should be given the license to set up the plants at Vishakapatnam and Kothagudium in Andhra Pradesh. The factory at Kothagudium was originally proposed to be set up by the Andhra Pradesh Government. Later on, that Government informed the Centre that it was not interested in setting up that factory and it had no objection if the Centre took it up. The Centre now wants to give that factory to the private sector as a number of persons had applied for the same. The Government of India has asked the Andhra Pradesh Government whether it would like to have some shares in the Kothagudium plant to be set up in the private sector. A reply is awaited from the Andhra Government.

Meanwhile, a fertilizer factory is proposed to be set up at Gorakhpur in Uttar Pradesh. This plant will be in the public sector. The Government of India is understood to have approached Japan for assistance in putting up this plant. Japan had earlier expressed her desire to assist India in erecting a fertilizer plant at Nahorkaliya in Assam, but as there was some delay in arranging the necessary credit, India is now going ahead with that factory with a British credit. India has now asked Japan whether she would like to offer the assistance which she promised earlier for Nahorkatiya for the Gorakhpur plant.

Demand exceeds supply

NITROGENOUS—Demand for nitrogenous fertilizers has greatly exceeded supplies. Against estimated requirements of more than 1.5 million tons, production of ammonium sulfate, the only nitrogenous fertilizer made in India, amounted to 378,575 tons in 1959, of which nearly 80 per cent was produced by the Government-owned plant, Sindri Fertilizers and Chemicals, Limited. Owing to foreign exchange difficulties, only a part of the deficit could

be met by imports, which amounted to 347,675 tons in 1959, 248,158 tons being ammonium sulfate.

In addition to the Sindri plant, which in 1959 began production of two new fertilizers, ammonium-sulfate-nitrate and urea, four other major nitrogenous plants are under construction or in the planning stage. One at Neyveli, Madras, has a rated annual capacity of 70,000 tons of nitrogen in the form of urea, and is expected to begin production in 1961-62. Another unit, capacity 80,000 tons, at Nangal, East Punjab, was scheduled for production in September 1960. An 80,000-ton plant will be located at Rourkela, Orissa, and a 90,000-ton plant will be at Trombay, Maharashtra State, near the petroleum refineries. The Trombay plant is not likely to begin production until 1963. An ammonium chloride plant at Varanasi, Uttar Pradesh, capacity 10,000 tons N, began operations recently.

The provisional Third-Plan target for nitrogenous fertilizers is 1,000,000 tons of nitrogen. There is a considerable gap between the target and current and approved capacity of 85,000 tons N. Following expansion of Nangal Fertilizers, Rourkela Fertilizers, Neyveli Fertilizers, Trombay Fertilizers, and Sahu Chemicals, Varanasi, total capacity will come to nearly 500,000 tons N, leaving a deficit of 500,000 tons. To meet this deficit, the Government proposes to install a nitrogenous fertilizer plant in each state. Although these plants were originally planned for the public sector, GOI is reportedly disposed to consider investment offers from private sources.

PHOSPHATIC—Despite the need for imported phosphate rock and sulfur, domestic production of superphosphate continues to increase. Total installed capacity for single superphosphate of 16 percent water-soluble phosphoric acid, the only phosphatic fertilizer manufactured in India, rose from 310,570 tons in 1958 to 330,670 tons in 1959, and production from 166,848 tons (27,808 tons P_2O_5) to 244,428 tons (40,739 tons P_2O_5). However, a major portion of the 1959 consumption target of 720,000 tons of phosphatic fertilizers (120,000 tons P_2O_5) in the Second Five-Year Plan remained unrealized.

Although only one-third of the

—International Scene...

capacity of 900,000 tons of phosphatic fertilizers (150,000 tons P_2O_5) proposed in the Second Plan has so far been attained and production still depends entirely on imported raw materials, capacity has been provisionally fixed in the Third Five-Year Plan at 500,000 tons of P_2O_5 . The target for phosphatic fertilizers by the end of the Second Plan in March 1966 has been raised from 120,000 tons of P_2O_5 to 150,000 tons of P_2O_5 and that of nitrogenous fertilizers from 370,000 tons N to 500,000 tons.

Another unit to be established in the private sector is Madras Fertilizer Limited, authorized capital \$2.1 million. To be located at Cuddalore, Madras, it will manufacture sulfuric acid and superphosphate.

A 40,000-ton superphosphate plant will be established in South India in the private sector. Known as Premier Fertilizers, Ltd., the new company will have an authorized capital of \$2.1 million, and production is scheduled for January 1962. The project is estimated to cost \$899,850; quotations for plant and machinery reportedly were received from firms in the United States, West Germany, and United Kingdom. Orders are expected to be placed by January 1961, construction to be completed and trials taken by the end of 1961.

East India Distilleries and Sugar Factories, Limited, Ranipet, Madras, which has been manufacturing only single superphosphate, proposes to install a plant to manufacture 51,000 tons of ammonium phosphate annually.

Adarsh Chemicals and Fertilizers Limited, Navsari, Gujarat State, will establish a new plant in the private sector, daily capacity 50 tons of sulfuric acid and 100 tons of superphosphate. The company has entered into an agreement with Chemical Construction Company Limited, London, which will provide technical assistance and also supply fully automatic plants for sulfuric acid and superphosphate. Total cost of the project is estimated at \$1.4 million, including working capital of \$357,000. The company is expected to begin production at the end of 1961.

POTASSIC—India depends on imports for most of its requirements of potassic fertilizers. The Second-Plan target of 60,000 tons of K_2O has been provisionally raised to 200,000 tons. Inasmuch as virtually no manufacturing capacity exists and the Government has no plans for establishing it in either the Sec-

ond or Third Plan, this fertilizer will have to be imported if the targets are to be achieved.

JAPAN

Expects continued high exports

Japan's exports of chemical fertilizers to Republic of Korea, South Vietnam and Pakistan account for about 15 per cent of her total exports. South Korea is an important market for Japanese fertilizers, taking about 40 per cent and 20 per cent, respectively, of Japan's total of ammonium sulphate and urea.

Some believe there will be no drastic cut in exports of fertilizers from Japan because the U. S. has little excess capacity, but since the West European export drive is serious, Japan would be seriously hit unless she develops her Southeastern Asia markets, especially India.

PAKISTAN

Pushing plant food education

The Government of Pakistan is planning to intensify their scheme for the popularisation of the use of fertilisers in both Wings of the country.

In East Pakistan, the Government will make a five-fold increase in the soil tests by employing a staff of well over 300 technicians.

Since 1957, the Food and Agriculture Organization of the United Nations (FAO) has been assisting the Pakistan Government in conducting a rapid soil fertility survey allied with a scheme for the popularisation of fertilizer.

Some 3,500 experiments have been carried out in East Pakistan and some 1,500 in West Pakistan.

The cultivators are now themselves asking for experiments to be carried out on their own fields rather than on their neighbours as was the case in the past.

This has been cited as proof of the success of the scheme and it is because of this that the Government is encouraged to expand the scheme to areas still untouched. FAO experts believe that paddy output in East Pakistan could be stepped up from the present 12,000 to 16,000 tons by simple fertilizer application. Taking into account the cost of fertilizers this would still mean a substantial profit for the farmer over and above the capital money invested as fertilizer, they say.

From the beginning, the scheme has concentrated on the fields of the ordinary farmers thus keeping a practical check on the results obtained through agricultural re-

search. In fact, the cultivator himself actually conducts the experiment under technical guidance.

The scheme is not only increasing fertilizer use throughout the country but is a means of collecting reliable practical information on fertilizer requirements of different areas both in kind and quality.

Canada Allocates \$15 Million

External Affairs Minister Howard Green has announced that Canada had allocated 15 million dollars for capital assistance to Pakistan, on the following basis:

Wheat to the value of 3,650,000 dollars, fertilizers to the value of 2 million dollars, aluminum to the value of 1,140,000 dollars, wood pulp to the value of 1,300,000 dollars, and aerial survey in the Chittagong area of East Pakistan at a cost of 500,000 dollars.

These grants total 8.6 millions.

Mr. Green said 15,000,000 dollars of Canada's 50,000,000 dollars Colombo Plan aid in the 1960-61 fiscal year has been allotted to Pakistan. Discussion with Pakistan would continue on how the remaining 6,400,000 dollars will be spent.

NEW ZEALAND

Fertilizer is vital to soil

The fertilizer industry in New Zealand is as old as the country itself, because prosperity there has always depended upon primary agricultural production. Generally, New Zealand's soils have low natural fertility and the continued regular application of fertilizer, particularly phosphates, is vital to pasture growth.

The demand for fertilizer, already high, has recently been increased, as thousands of acres of previously inaccessible hill country are brought into production through the use of aerial topdressing. Substantial areas are still awaiting development by this method. Three new plants have been built since 1958 to handle this increased demand for fertilizer and plans for a fourth in the North Auckland area are being considered.

The fertilizer industry in New Zealand comprises twelve major plants turning out more than 120 different types of fertilizer. Together they produced more than one million tons in 1959-60, an increase of nearly 17 per cent from the previous year. (The more striking 23 per cent rise in total deliveries is somewhat inflated as many farmers increased fertilizer application over the last year to make up for lower usage in 1958-59.)

Competition within the industry

is keen and has quickened in recent years when three farmers' cooperatives began producing.

Although fertilizer in New Zealand is essentially phosphatic, there is a marked trend away from pure superphosphate to mixtures. Production is being adapted to this growing demand for superphosphate mixed with potash and other elements.

NEW ZEALAND'S PRODUCTION OF FERTILIZER ('000 tons)

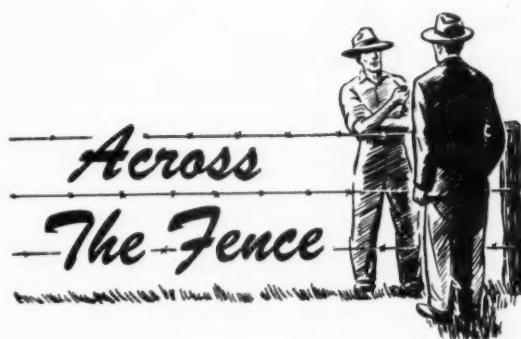
Type	1949-56	1957-58	1958-59	1959-60	Percentage increase or decrease 1949-56-59-60
Straight super	439	394	318	268	-39
Aerial super	16	97	157	157	+157
Serpentine super	128	203	152	169	+32
Lime reverted super	20	28	30	31	+55
Cobaltized super	58	95	89	87	+50
Other mixtures and compounds	50	231	262	398	+696
Total	695	967	949	1,100	+60

European countries, chiefly West Germany, Belgium, the Netherlands, and France supply the bulk of New Zealand's imports of fertilizer, Canada's present sales comprise only very small amounts of ammonium sulphate (81 tons for the first eight months of 1960). The market is, however, large enough to attract competitive suppliers.

In 1959, 113,109 tons worth £NZ 1,209,961 (Can. \$3,327,000) were imported. Potassic fertilizers made up more than half this amount, both by price and volume. In the first eight months of 1960, imports of phosphatic fertilizers were much greater than last year, but potassic types had slipped to only a little more than half. Nitrogenous fertilizers accounted for about 10 per cent of the total weight and about 18 per cent of the value in both years.

Midwest Researchers Report Progress

The NPFI Midwest Research and Education Committee met in Chicago last month to report on progress, and to make recommendations for current year plans. They suggested research grants-in-aid to three university projects, a special \$2500 fund for research on high fertility soils, an economic study of crop production costs in relation to fertilizer use . . . another \$2500 for this, funds to set up and distribute dealer record forms to help the dealers determine their profit and loss situations, funds for a film strip on fertilizer materials handling.



facts
to
help
you
sell

Farmers who have exposed subsoils in the process of land leveling for irrigation or other reasons can take heart. Subsoils adequately fertilized can be as productive as topsoil. USDA's soil scientists have some valuable data on the subject.

Twenty percent more milk per cow is a potential when the pasture is properly fertilized, according to experience on oats, vetch and Coastal Bermuda pastures.

A North Carolina lady farmer can't say enough about soil tests. She followed the recommendations and sold \$300 more tobacco than she had been selling from the test field.

You can't repeat this basic truth too often: Low cost crop production is the key to farm profits in today's competitive markets. . . . and this in turn depends on getting high yields per acre . . . and an essential tool in this profit-building, cost-cutting job is fertilizer. These are extracts from remarks by the chairman of the U. of Missouri soils department, Dr. George E. Smith.

Too many pastures are gymnasiums where cows do more exercising than eating, according to C. J. Chapman, recently retired from U. of Wisconsin, who advocates a sound plant food program so the cattle can eat their fill in 2 hours—and have plenty of time for cud-chewing under the shade of a tree. This way lies more milk or meat, he points out.

More Lawns Than Ever Get Plant Food This Year

In line with the trend toward more and more specialty fertilizer sales, turfgrass specialist Dr. M. P. Britton of the University of Illinois predicts that more than 43 million American home-owners will buy fertilizer this year to improve their lawns. He figures about 45% now put fertilizer on their lawns, averaging about 51 pounds per lawn last year, or 1,100,000 tons. This amounts to something like 12 pounds per 1,000 square feet average.

Chemical Laboratory Peak

A new high of nearly \$200,000,000 was reached in 1960 for completion of new chemical laboratories by manufacturers.



INDIANA FARMER WINS TOP PRIZE

Bob Homan (left), Westville, Indiana, was one of 23,833 farmers who signed a Spencer Chemical Company fertilizer "pledge" recently. Mr. Homan emerged from this field as the Grand Prize winner and will receive about 40 tons of plant food (the equivalent of the \$2,500 top prize) for use on his 306-acre farm. Mr. Homan is shown here discussing his fertilizer plans with C. N. Boehlke of the Wanatah (Ind.) Mercantile Company, who figured prominently in the prize since he persuaded Mr. Homan to sign the contest entry which asked farmers to pledge to consult their fertilizer dealer about proper plant food use. He plans to supplement his 40 "prize" tons with additional material in an effort to top the 115-bushel yield he got from much of his corn acreage last fall.

IMC Advisory Panel Speakers Predict Early Recovery From Slump

Economic recovery "at or before mid-year" is indicated by available statistics and by the performance of the economy in the first quarter, according to Martin R. Gainsbrugh, chief economist of the National Industrial Conference Board.

In an address March 9 to the National Fertilizer Industry Advisory Panel at International Minerals & Chemical Corporation, Mr. Gainsbrugh said that with each passing month the current business downturn fits more into the pattern of "previous postwar inventory adjustments" which were short-lived rather than major.

In a report on the agricultural economy also given the panel, Anthony E. Cascino, IMC marketing vice president, said the farm outlook is for "an even better year than last, which was good."

He said cash receipts in the year ended June 30, 1960 were almost equal to the record high of \$34½ billion, and farmers' bank deposits are at a record high level. Mr. Cascino forecast a 10 per cent increase in fertilizer use over last year, when

fertilizer use was at a record level.

Mr. Gainsbrugh said that a survey of capital appropriations plans of the 1,000 largest manufacturing companies indicates further curtailment of plant and equipment expenditures in 1961, "but of a milder character than the previous sharp cuts in capital spending in earlier postwar recessions."

The economist noted that the current business contraction has been milder in many ways than those preceding it. Industrial production has fallen only 7 per cent from its peak, as against 13 per cent in 1957-58. Personal income currently is higher than before the recession began. Heavy construction contract awards, so far this year, have run over 15 per cent ahead of the first two months of 1960.

Currently, inventories have come into balance, "so much so that new orders are now flowing in at a faster rate than production," indicating a favorable influence on employment in the weeks ahead, Mr. Gainsbrugh asserted.

The Advisory Panel is made up of

10 leading fertilizer industry executives from every section of the country. The panel meets annually to discuss trends, objectives and problems of agriculture and the fertilizer industry.

Industry leaders participate on a rotating basis, two new members coming in at each meeting. This meeting was the fourth since the panel was formed at the suggestion of IMC.

The conclusions and recommendations of the board are circulated widely and have gained broad acceptance by the plant food industry.

Indiana Lining Up With 13 State Conference Plan

A hearing will be held April 7 at Purdue University over proposed changes in fertilizer regulations, two in number. One will permit tag guarantees of 12 elements in addition to NPK; the other—on custom mix fertilizer—provides for a printed or written statement of the net weight and the name and address of the person responsible.

The new proposal is in line with the recommendations of the recent 13-state conference of regulatory officials and agronomists.

CF Staff-Tabulated TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by Cooperating State Control Officials and Tabulated by COMMERCIAL FERTILIZER Staff

	February		January		January-June		Oct.-Dec. Quarter		July-December		YEAR (July-June)	
STATE	1961	1960	1961	1960	1960	1959	1960	1959	1960	1959	1959-60	1958-59
Alabama	-----	53,245*	15,481	20,335	101,830	89,701	181,587	180,959	869,240	846,309	1,050,199	1,045,560
Arkansas	23,548	22,095	9,882	9,422	19,029	17,011	61,634	58,714	303,835	289,363	362,548	353,130
Georgia	35,094	32,254	31,712	39,496	181,314	163,516	313,241	299,194	1,102,220	1,130,998	1,401,414	1,425,749
Kentucky	-----	36,846*	-----	62,564*	58,468	59,541	102,192	108,734	461,786	483,820	570,520	591,380
Louisiana	17,421	17,104	11,205	8,576	39,930	31,468	73,814	66,744	224,087	201,642	290,821	265,794
Mississippi	46,462*	-----	17,825*	-----	65,307	68,869	145,632	144,374	547,221	516,917	689,797	693,288
Missouri	-----	32,353*	40,032	12,602	178,350	124,202	334,657	277,708	524,336	563,055	802,044	933,090
N. Carolina	-----	96,844*	70,678	69,754	131,674	115,087	202,694	175,533	1,381,263	1,468,704	1,556,796	1,696,759
Oklahoma	9,875	5,440	5,108	2,617	33,294	26,572	94,690	72,511	72,246	64,738	144,757	133,586
S. Carolina	73,099	57,015	30,504	30,971	63,732	57,460	110,096	104,903	678,986	756,100	783,889	890,302
Tennessee	40,972	28,885	21,338	34,738	41,164	38,359	124,747	117,275	480,429	443,602	607,727	570,718
Texas	53,844	51,647	27,352	26,946	109,667	117,901	234,376	233,410	474,627	441,851	708,037	664,651
California	(reports compiled quarterly)				242,846	253,956	462,347	465,495	813,116	803,261	1,278,611	1,262,996
Virginia	(reports compiled quarterly)				93,949	72,546	168,479	141,177	591,113	618,965	732,290	779,143
Indiana	(reports compiled semi-annually)						317,372	321,956	828,164	856,316	1,150,120	1,172,657
New Hampshire	(reports compiled semi-annually)						-----	3,694*	14,488	16,143	18,182	20,889
TOTAL	253,853	214,440	263,292	255,457	1,360,554	1,236,189	2,927,558	2,768,687	9,367,157	9,513,181	12,147,752	12,499,692
----- (not yet reported)		* Omitted from column total to allow comparison with same period of current year.										

(not yet reported)

* Omitted from column total to allow comparison with same period of current year.

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- 3 — National 10' x 78" rotary dryers, 3/4" shell.
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- 2 — Davenport 8' x 60' rot. dryers, 7/16" welded
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- 2 — Bonnet 7' x 60' rot. dryers, 5/8" shell
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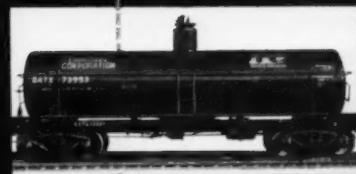
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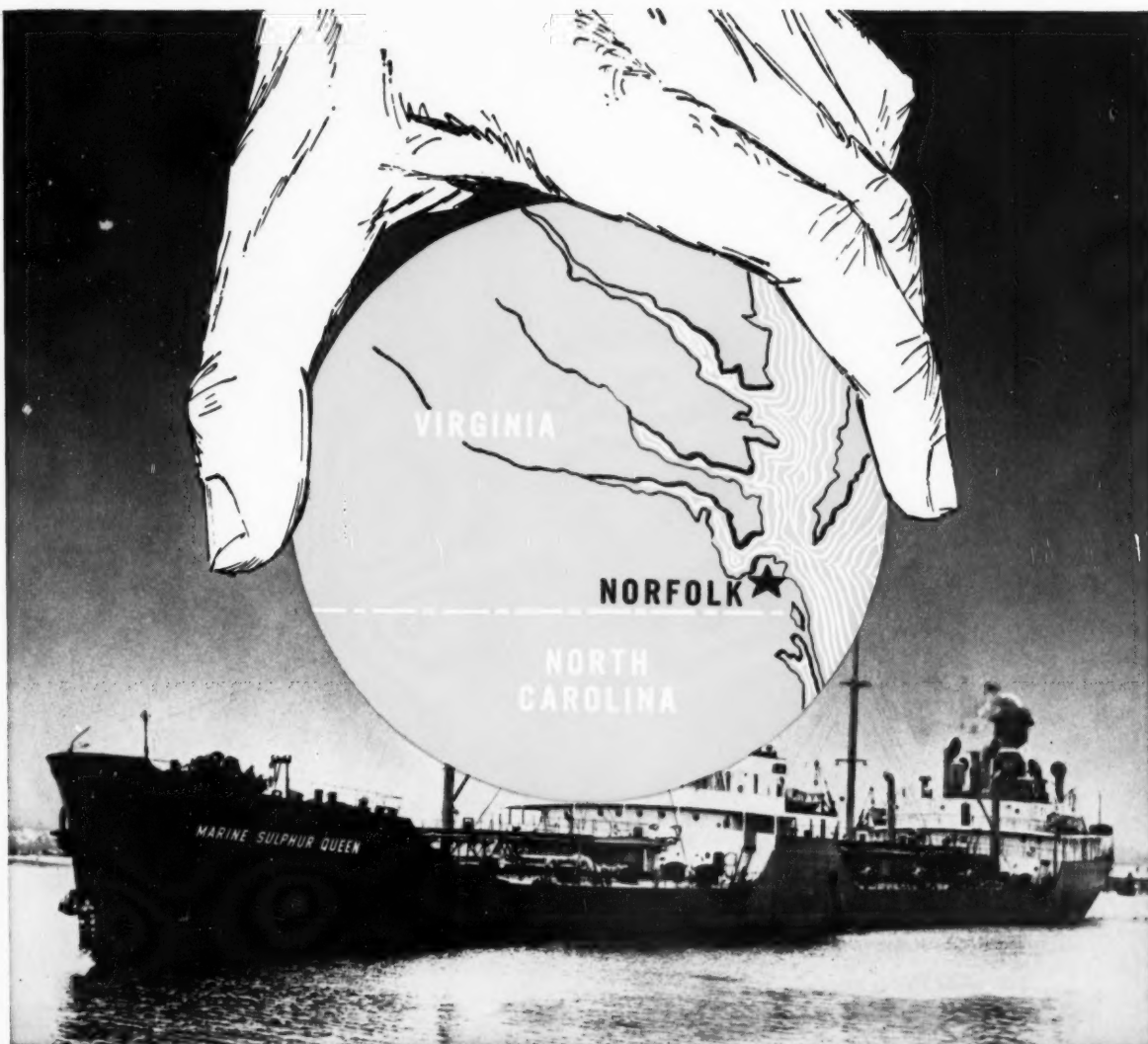
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